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volume 13 number 6
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south african institute of foundrymen

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EDITOR'S COMMENT

Taiwan – a productive and industrious culture

My recent trip to Taiwan entailed visits to several manufacturing facilities, including the foundry of Victor Taichung, one of Taiwan's leading machine tool builders based in the country's manufacturing region in Taichung, about two hours south of Taipei.

These visits are always enlightening as they give me a chance to not only compare our own manufacturing facilities in South Africa, but also to compare them to facilities that I have visited in Brazil, Germany, Japan, Switzerland, USA, UK, Spain and Belgium to name a few.

I always go with an open mind with the hope that I will be surprised and impressed. Well I certainly was in this instance.

Taiwan is up there with all the developed nations in terms of technology. The manufacturing plants might not be on the grand scale like the bigger facilities in Japan or the USA but with their ambition to increase equipment capabilities and quality while keeping unit prices down, it won't be long before they are challenging these more illustrious nations.

Taiwan is the world's sixth largest machine tool producer and fourth largest exporter.

Approximately 75 percent of the island's machine tool production goes to the export market. Taiwanese machine tool builders tend to be relatively small, family-owned businesses, but they are well-supported by the national government. This is because the government recognises that manufacturing and machine tool building is vital to the island's economic growth and development.

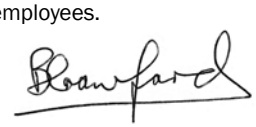
For a country that is just under half the size of Mpumalanga Province and has a population that is less than half of South Africa it is very productive and its peoples are industrious, productive and friendly and this is very noticeable. Most are well educated and take pride in what they are involved in.

The trip involved a two-hour bus journey from Taipei to Taichung and, except for the mountainous areas, every available space is being utilised. In between the apartment blocks and factories there are either rice paddy fields or fields with fresh produce being grown and there are people working them. It is wonderful to see the harmonious coexistence between factories, farmland and living areas. The downside of course is that there are very few green lungs.

In the manufacturing plants that I visited there was no distracting noise coming from loud chatter amongst colleagues, no standing around doing nothing. In fact the employees did not engage us visitors unless you engaged them. You could see that their attitude in the work environment is one of being proud and productive. The same impression was gained in the hotel where we stayed and wherever we went.

What was more noticeable was the lack of personnel in these facilities and more so in the Victor Taichung foundry. For a foundry that casts approximately 1 200 tons of metal a month there were at most 50 employees.

Don't you wish that we could create such a culture in our country?



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- Progelta: molten metal treatment and automation systems for grey and ductile iron foundries
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Moulding the future of large iron castings

The challenges of the highly engineered casting market have created more stringent quality specifications than previously encountered for large iron castings.

To meet the required quality levels, and particularly to control inclusion and oxide defects, foundries producing large iron castings must control sand entrainment and minimise molten metal turbulence in the mould. They do this using modern foundry simulation programs to optimise their gating and methoding practice, and by incorporating ceramic tile runner systems and ceramic filter encasement systems at the lowest point in the mold, near the in-gate. It is common for foundries to incorporate ceramic hollowware runner materials on castings larger than one ton.

A new lightweight runner system Hollotex EG Runner resin-bonded, carbon fiber-reinforced refractory systems, available exclusively from Foseco, provides the benefits of ceramic tile without some of the negative side effects. Investigation and customer feedback have confirmed the system as a replacement for ceramic tile in many large ferrous casting operations.

The Hollotex EG Runner system is available in diameters ranging from 30 to 70mm. Push-fit, in-gate break-off and diameter conversion adaptors comprised of a low-density core-shot material are also available, to connect or terminate sections.

The particular features of Hollotex EG Runner systems provide several benefits to the metalcasting process.

Ease of assembly

Each tube, elbow, and t-junction has a flange at one end. With these ends, Hollotex EG runner system components are easy to assemble with male/female push-fit connections. The entire gating system design can be assembled without glue, tape, or supporting rebar.

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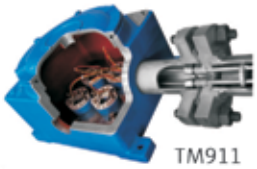

Panel meters / indicators The RIA45 is a digital panel meter with a control unit for monitoring and visualising analogue-measured values in control rooms and cabinets, laboratories, and process control environments, amoung others. The RIA46 has similar functionality to the RIA45, but can be used in the field.

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Reduced weight

Hollotex EG Runner components are 90% lighter than conventional ceramic tile. Due to the low weight of the components, they are extraordinarily easy and fast to assemble, therefore, the productivity of the moulding facility increases.

The ergonomic value is based on the reduction in physical strain for workers who now have only to push-fit such lightweight gating systems. Because of its light weight, it is possible to connect multiple tubes without tape, hot wax, adhesive or glue. It also eliminates the use of steel rebar support systems, so there is no need to collect and straighten the supports after shakeout.

Easy to cut

Hollotex EG Runner components are simple to shorten with a hacksaw. A scale for easy measurement is formed on the exterior of the tubes when manufactured. There is far less airborne dust compared to dry cutting conventional ceramic parts. When ceramic parts are wet cut they need to be dried before use. With Hollotex EG Runner components, the remaining cut-off portions can be used with adaptors. This will consume most scrap pieces that would otherwise be discarded.

Reduced inventory costs

The product's flexibility simplifies inventories. Because they are easy to shorten, only one tube length may be required. This reduces stocking many different lengths of the same diameter tile, and improves cash flow.

Reduced contamination and dumping costs

As a result of the composition and lightweight of Hollotex EG Runner products, virtually no additional material remains post-shakeout, and contamination of the sand system is not an issue. Consequently, there is no need to remove ceramic fragments during reclamation.

Disposal costs for clay ceramic tube fragments/remnants are often very expensive. By eliminating hard ceramic fragments in the sand, wear on downstream activities like the shakeout machine, sieves, transport belts, and sand coolers is reduced, lowering the costs for service and maintenance of these facilities.

Hollotex EG Runner components can withstand the weight of the surrounding sand during moulding. Unlike ceramic tile materials, which are fragile, the components will not break when dropped on the ground or tipped over on the pattern plate. There is little scrap from application. All remaining pieces from cuts can be connected and used. Adaptors are formed at the ends of all elbow and t-junction tubes that can be cut off and used to connect all the remaining pieces.

Low-density core-shot adaptors are available for conversion, to link one diameter tube to another, and in-gate break-off adaptor rings are available, too. This allows most gates to practically fall off in shakeout. There is also a reduction of "ceroxide" defects related to turbulence in standard ceramic tile systems.

The ease of handling Hollotex EG Runner systems offers many benefits, including productivity improvements and cost reductions. The service and maintenance of foundry equipment will be reduced too, and there will be savings by eliminating the disposal of ceramic runners as normal foundry waste. Adopting Hollotex EG Runners in large iron foundries has helped to simplify everyday moulding operations and helped customers meet the rising quality requirements of their customers.

Foseco is the Foundry Division of Vesuvius and is a global leader in manufacturing and providing products and solutions for improving foundry performance. The company does this by working alongside their customers to develop and apply products and services that produce better casting quality and higher productivity at lower costs in a safe and healthy working environment.

The Vesuvius group comprises four global businesses comprising Steel Flow Control, Linings, Foundry and Fused Silica.

The businesses share a wide common technological base which gives strength to their people expertise. They have a similar business model based on partnership and cooperation with customers.

Foundry business

From its humble beginnings in a small room in Birmingham Foseco has become an international supplier of consumable products to the foundry industry. Foundry Services Limited was established in 1932 as a supplier of flux products to brass and bronze foundries in Birmingham, England. The "Foseco" brand name was first used in 1934 and originates from the words FOundry SErvices COmpany.

The original success of the company was based not only on the provision of high quality products, but also on service and problem-solving as well as the development of application technology. This philosophy remains one of Foseco's core values to this very day.

Since 1932, Foseco has continuously developed product and process innovations for the foundry industry. These include exothermic and insulating feeding systems, filtration of liquid alloys, direct pour technology, solidification simulation software, non ferrous metal treatment and degassing systems, metal stream inoculation, electrostatic coatings, environmentally friendly binders and insulating ladle lining systems.

The reduction of metal or additives consumption is a source of savings in raw materials, energy and environmental impact for Foseco's customers. Foseco is focusing on new solutions to deliver more effective casting processes for clients and the foundry market place.

Foseco is a leading brand in products and solutions that help improve foundry performance. Located in 32 countries they pride themselves on providing local solutions that serve the individual needs of iron, steel and non-ferrous foundries worldwide that manufacture castings that are vital components in applications such as automotive, aerospace, power generation, construction, mining and general engineering.

Foseco offers a wide range of foundry consumables and equipment.

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Price controls will hurt scrap producers

Claire Bisseker | 08 March 2013 Financial Mail.

Government's plan to impose price controls on scrap metals will hurt producers of scrap. But the sector that consumes these products, the foundries, is backing the plan because it has waited so long for government support, it will accept it even though it knows it to be imperfect.

The economic development department's (EDD) draft policy seeks to force scrap merchants to first offer their wares to domestic purchasers at a discount to the international price before being allowed to export them. The aim is to boost the competitiveness of domestic manufacturing industries which use scrap as input into their own activities.

Scrap metal producers are crying foul, pointing out that theirs is a competitive sector which provides employment to almost 450,000 people. It is bad for the economy as a whole to disadvantage scrap producers in order to benefit only the consumers of scrap, they argue.

A recent study by expert analytical firm Conningarth Economists has indeed found that export price control by means of export taxes or other means will have a detrimental financial and employment effect on the SA economy.

Unfortunately the report, commissioned by the Employment Promotion Programme Phase III, which is managed by the University of Cape Town and reports to a broadly representative industry reference group, came out too late to influence government's draft proposals.

Stellenbosch economist Cobus Venter, a consultant to the Metal Recycling Association, urges the EDD to review its proposals in the light of the Conningarth findings to avoid making "a potentially disastrous industrial policy mistake".

"The Conningarth report found that the export tax scenario has by far the worst economic impact when all affected sectors are taken into account," says Venter. "This explains why these types of controls are almost never implemented in modern, open economies."

Business in South Africa is generally strongly against the notion of domestic price controls and it is conceivable that the EDD's proposals will be challenged in court if they are implemented.

Saleem Mowzer, special adviser to EDD minister Ebrahim Patel, counters that rising exports of scrap metal have resulted in job losses, the destruction of industrial capacity and risks to South Africa's infrastructure programme; they have had a negative impact on energy use and they affect South Africa's commitments to reduce carbon emissions.

Scrap metal exports grew by 62% between 2007 and 2011 while foundry outputs declined by 13% over the same period. About 30 foundries have closed over the past 10 years, three of them in the past two months.

Without a sustainable foundry industry, South Africa's general manufacturing sector is at risk since at least 80% of metal manufactured goods have a castings component in them. (The foundry industry turns scrap metal into castings ranging from kitchen taps to car components. In South Africa, the automotive sector, mining, transport and general manufacturing are the main users of castings.)

The industry's problems, says John Davies, CEO of the SA Institute of Foundrymen, range from high input costs (including scrap, which accounts for 15% – 40% of the cost of producing a casting) to environmental compliance, the high cost of new technology, skills shortages, and stiff competition from low-cost manufacturing nations such as India or China.

"Should government not intervene, we would see de-industrialisation and job losses not only in the foundry industry but also in downstream sectors that depend on inputs from foundries, including manufacturing and infrastructure," says Mowzer.

The Conningarth report confirms there is a clear need for government to avoid the foundry industry's eventual closure through policy neglect, but finds there is a better way of doing it than the current EDD proposals. It says the optimal solution is for government to pay a supply grant to scrap metal recyclers per ton supplied to the foundry industry and, in the case of aluminium, for the subsidy to be paid to foundries on the scrap they buy.

"The foundry sector, because of its distress, would welcome anything that reduces input costs," says Davies. "A subsidy could be a better option because it could be directly applied to the foundry sector. But we're not rejecting the draft proposals because they could be implemented in the short term, whereas the subsidy proposals would first have to be submitted to Nedlac, could take years to happen and would require funding from the fiscus."

"The Conningarth report found that the export tax scenario has by far the worst economic impact when all affected sectors are taken into account. This explains why these types of controls are almost never implemented in modern, open economies."

"It sounds quite selfish," he concedes, but says "the industry has been talking to the department of trade & industry about this matter for the past 15 years and is concerned about its wellbeing."

Mark Krieg, executive director of the Aluminium Federation of South Africa, says his members support government's proposals for the same reason: any other intervention would take years. "The alternative is that the foundry sector closes down and South Africa's de-industrialisation continues," he says.

An independent economist, who requested not to be named, is aghast at the attitude of both industries. "They're like two dogs fighting over a bone!" he says. "I would have thought there'd be more maturity over this because of the principle at stake. If you introduce price controls, it's no trivial matter. The resistance in business to it is huge."

Venter is equally dismayed, especially since the project industry reference group representing both sides (the scrap industry and the domestic beneficiation sector) had unanimously accepted the Conningarth report.

Mowzer says that once the period for submissions on the proposals closes, these will be evaluated.

John Davies, CEO of the SA Institute of Foundrymen, responds to this report

The Economic Development Department (EDD) policy proposals are intended for the whole scrap consuming industry, whilst the Conningarth Report (CR) is directed only to the foundry sector, which consumes a maximum of 500 000 tons of recycled metal per annum out of a total of 3 500 000 tons collected, with 1 600 000 tons exported in 2012, of ferrous scrap only. So the impact of foundries on the total recycling sector is relatively small.

The real issue relates to the fact that the export of recycled ferrous metal does not encourage the beneficiation of material required by the foundries, resulting in a shortage of the correct quality of metal scrap, thus negatively impacting on the efficiency of the metal casting industry and so affecting its competitiveness.

The CR was commissioned following an impasse at NEDLAC, and needs to be tabled at that forum before further constructive comments can be made, because it requires the agreement by Treasury to provide the subsidy, failing which we are back to square one. This is the main reason for maintaining a position of support for the EDD proposals at this stage.

Most foundries support some form of intervention to assist with the rising input costs, and to prevent further import leakage of castings traditionally made by the local industry.

On this basis the SAIF continues to liaise with all the stakeholders to achieve a workable solution. The EDD proposals could bring certain benefits to the foundries, and whilst the CR suggests some solutions they need to be tested in practice, given the support of the Government, before full implementation.

Providing a subsidy to the supplier and not the foundry using the ferrous scrap material, may be difficult to sell to the foundries, so a scheme may be easier to administer if all subsidies were paid to the foundry or secondary smelter, in the case of aluminium scrap.

A preferential price for aluminium scrap - Aluminium Federation of South Africa (AFSA) responds to this article

When Governments introduced legislation to limit vehicle emissions AFSA predicted a global shortage of aluminium scrap.

Aluminium offers a range of significant benefits particularly to the transport sector. It is light and strong, is easily formed, extruded, welded and cast. Not surprisingly, the aluminium content in cars has grown from 30 kgs per car to 130 + kgs per car. To a large extent the aluminium is used in the drive train components, which are castings.

Aluminium scrap is the main feedstock in making casting alloys. Melting scrap requires about 5% of the energy needed to produce primary aluminium.

This makes it a valuable strategic resource, a fact long recognised by competing countries that have imposed up to 40% export duties on scrap, or completely banned its export.

These factors have driven up the price paid for scrap by the world market, especially for good quality, clean dense scrap.

South African foundries face a range of challenges. They are starved of the good quality scrap, and forced to use expensive, poorer grades with higher melt losses. Productivity is low, with increasing labour unrest and the escalating energy costs.

Input material accounts for 40% of a pressure die casters costs.

AFSA supports the need for firms to be globally competitive. However, it is well known that competing countries offer numerous incentives to their industries, including lower cost of capital and export incentives. Importantly their industries produce significant volumes, which provide huge economies of scale and quality benefits.

Clearly the playing field is not level. This degree of market intervention leads to the failure of economic theory.

AFSA participated in the macro-economic study undertaken by Conningarth Economists. The report established a number of important trends and facts:

- The export of scrap metal has been increasing
- Output from local foundries has decreased
- If there is no intervention the foundry industry will continue to decline. Its closure will surely impact the South African economy. (AFSA has tracked the closure of 38 aluminium foundries over the past 10 years).

The metal and foundry sectors are an important component of Government's Industrial Policy Action Plan (IPAP).

Foundries will be required in the ambitious Vision 2020 program for the automotive sector. The plan calls for doubling of volume and of local content, which will require a major investment in new plant.

Similarly the local manufacturing sector is expected to supply products and components for the Government's Infrastructure Program, growing the sector and employment.

AFSA firmly supports a developmental price for the raw materials used by downstream industries. It will go some way to levelling the playing field, and encourage entrepreneurs to invest in their manufacturing plant.

For South Africa to succeed all stakeholders need to take stock and commit to work with Government to build an economy that adds value, grows, and employs and develops our human assets. ■

Bric countries to be big winners in future auto investment, says KPMG survey

Notable market growth in Brazil, Russia India, China (the Bric countries), as well as other emerging markets, is a predominant trend in this year's KPMG Global Automotive Executive survey, which polled 200 auto executives from 31 countries.

In the survey, released in South Africa in March, an average of nearly 6 out of 10 respondents say they will increase their investments in the Bric countries, which are expected to account for nearly 50% of all global vehicle sales by 2018.

China is the first choice for investment, followed by India, Russia and Brazil, and then South Africa, in fifth place. Following South Africa as an investment destination is Indonesia, Turkey and Vietnam.

"South Africa has for the first time also been highlighted as an investment destination," says KPMG Africa Automotive leader Gavin Maile.

Not only are Bric countries expected to see a surge in vehicle sales, but automakers in these countries are also setting their sights on export markets in the next three to five years.

"This situation is similar in South Africa, where there is an export focus as the number of vehicles manufactured cannot be absorbed within the local, or African, market," says Maile.

In addition to exports, it is anticipated that Bric countries will build production hubs for their vehicles close to Western markets.

In the Americas, 39% of respondents expect Mexico to become a production hub for the European market, while 70% favour Eastern Europe.

"Given the opportunities of Eastern Europe as a hub, combined with strong local growth potential, it can be expected that this region will increase in importance as an automotive player in the near future," says KPMG global automotive head Mathieu Meyer.

Europe taking strain

As the race to conquer the high-growth emerging markets picks up, sales and production declines remain a concern, especially in Western Europe where a sizable proportion of respondents expect sales and production to decrease in Spain, Italy, France and the UK.

The US seems to have managed the turnaround as more than 40% of respondents expect that vehicle sales will either remain steady, or increase.

A majority of respondents for the Bric countries, as well as Indonesia, Malaysia, Mexico and South Africa, predict an upward sales trend.

To counter dips in sales and output, automakers are looking at ways to manage capacity. Twenty-five per cent see industry consolidation, joint ventures or alliances as an appropriate solution. However, approaches differ widely among various countries and regions, with no common solution identified to date.

In terms of which automakers are expected to fare well in market share over the five-year period, just two come from the West – Volkswagen and BMW. Four Chinese manufacturers are among the top ten.

US top automaker Ford slid down the ranking from eighth in the KPMG 2012 global auto survey to fourteenth this year, just above General Motors.

And what drives sales among consumers?

Consumer interest in fuel efficiency for cost reasons is the primary factor in vehicle purchasing decisions, according to 92% of survey respondents. Environmental concerns such as reducing carbon dioxide emissions are still important, but slipped from second place in the KPMG 2012 global auto survey to fourth this year.

Twenty-nine per cent of car manufacturer and supplier executives say they will invest in downsizing and optimising internal combustion engine (ICE) technology.

Just over half of respondents say that ICE optimisation will offer the greatest potential for clean, efficient engines for the next six to ten years.

"There is an increasing realisation that the ICE has further scope for optimisation," said Meyer. "This a quite a turnaround in direction and a sign that some of the newer technologies are taking longer than expected to emerge."

Investment in plug-in hybrid technology will be key for 24% of car manufacturer and supplier respondents, while only 8% say they will invest in pure battery technologies.

** Thirty-nine per cent of respondents in the KPMG survey are based in the Europe, Middle East and Africa region, 37% from Asia-Pacific and 24% from the Americas.* ■

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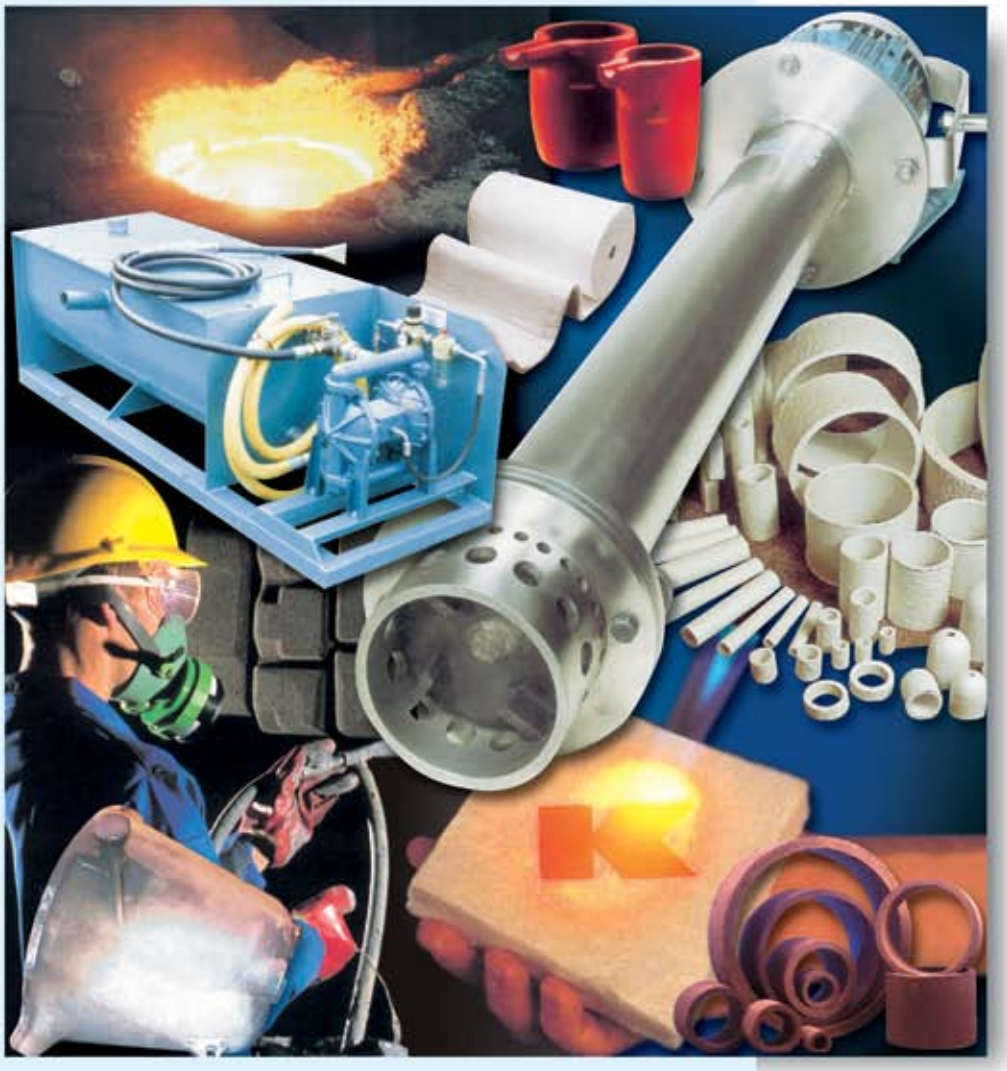

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Weir Group acquires Xmeco Foundry to support global growth objectives

Weir Group PLC announced that it will purchase the Port Elizabeth-based Xmeco Foundry (Pty) Ltd, which will form part of their Weir Minerals Africa business unit, an integral part of the Weir Minerals division. This acquisition will expand its in-house casting capability and enable the local production of its product range in support of global growth, whilst at the same time expanding Weir's capacity and capability on the African continent. Subject to regulatory approval, the purchase is expected to be completed in May 2013.

Specialist large casting foundry Xmeco occupies a 4.5 hectare site in the Neave Industrial Park, Neave Township, where it manufactures castings varying in size from a few kilograms up to a maximum of 18 tons, in a variety of alloys. The privately owned company, employing more than 100 personnel, was established in 1978 by current owner John Exley's father. Exley has agreed to remain with the business to manage special projects relating to the foundry expansion, modification and integration.

Dave Athey, regional MD for Weir Minerals' Middle East and Africa Region, says the acquisition of Xmeco, subject to regulatory approval, is consistent with the company's growth strategy and will support the African and Minerals divisional requirements.

"The Xmeco acquisition complements our existing African operation, adds the heavy bay capacity vital for future growth and boosts our existing foundry expertise with valuable new talent and specialised foundry personnel," he adds. "It will also enhance productivity with the application of Weir's lean philosophy in production, manufacturing technology, supply chain and front end business processes."

Dave Athey, regional MD for Weir Minerals' Middle East and Africa region

"Xmeco is a well-managed business that, with our guidance, investment and leading edge technology, will be developed to reach its full potential. In return, Xmeco will add significantly to our capabilities — being a perfect fit with our strategy and future growth plans. The investment broadens our core foundry capability in a space we understand well, while providing extensive opportunities for the combined business and the people it employs."

Dave Athey, regional MD for Weir Minerals' Middle East and Africa region and Rob Fawcett, operations director for Weir Minerals Middle East and Africa region, acknowledge Xmeco and its employees as part of the company's growth plan

Commenting on the sale of his business, Exley adds: "I've been looking for a partner capable of taking this business into the future, building on what has already been achieved. Securing the longevity of the facility, the job opportunities created and the contribution to the economy as a whole were all important factors in making my decision. Weir's proven track record, manufacturing excellence and the impressive development of its Gauteng based facilities, leave me in no doubt that this is the correct decision for the next phase in Xmeco's life and development."

International acquisitions

Two other international acquisitions have also been made in early 2013 by The Weir Group PLC, one of the world's leading engineering businesses. Weir has extended its leading presence and capabilities in global mining and oil sands markets with the acquisition of the R Wales group of companies, a leading Canada-based manufacturer of wear resistant linings. In addition, Weir's best cost supply chain strategy has been advanced with the acquisition of the Cheong foundry in Malaysia.

With Canadian facilities in British Columbia and Ontario and a US facility in Arizona, R Wales designs and manufactures rubber lining for pipes, tanks, chutes and hoses and specialises in custom rubber and urethane moulded products

as well as mill liners. The acquisition extends Weir's aftermarket position in the production and servicing of a wide range of rubber lined wear components for the North American oil sands and mining sectors and complements the existing customer base and product portfolio.

Together with the acquisition of Xmeco in South Africa, Weir has advanced its global foundry supply chain strategy with the acquisition of the business and assets of the Cheong foundry. Based near Kuala Lumpur, the facility supplies castings to a number of industries, including mining and power. The acquisition enables Weir to add foundry capacity to serve the Asia-Pacific region with high quality products from a best cost sourcing region.

Weir Chief Executive, Keith Cochrane, said: "The R Wales Group and the Cheong and Xmeco foundries enhance the Group's presence in important growth markets. The Wales Group develops our leading aftermarket offering in the minerals and oil sands sectors, while the Cheong and Xmeco foundries expand our low cost capacity in the fast growing regions of Asia-Pacific and Africa, enabling us to deliver quality products more quickly to our customers."

About Weir Minerals Africa

Weir Minerals Africa is a global supplier of excellent minerals solutions, including pumps, valves, hydrocyclones, wear-resistant linings, screens, hose, rubber products and de-watering products, backed by a superior technical service which enables customers to achieve significant improvements in their process efficiencies. This focused approach provides clients with a host of benefits, including optimised performance, maximised capacity, efficient operations, ease of maintenance and equipment longevity.

Weir Minerals Africa prides itself on providing customers with application-specific products tailored and customised to cope in often demanding and arduous conditions.

For further details contact Rene Calitz of Weir Minerals Africa on TEL: 011 929 2622 ■

The metal parts for the impressive Warman MC pump are cast at the Xmeco foundry

Durrans RMS achieves Level 2 BBBEE rating

Level 4 BBBEE rating is awarded to sister company Resistant Materials Services (RMS).

Foundry consumable manufacturer and supplier Durrans RMS has recently completed its broad-based black economic-empowerment (BBBEE) rating and is proud to announce the outstanding achievement of attaining Enterprise Level 2 contributor, the company has reported.

Durrans RMS is a joint venture business between James Durrans and Sons (United Kingdom) and Resistant Materials Services. This company manufactures and distributes mould paints and refractory parting mediums that are both water and spirit based.

Additionally Durrans RMS distributes carbon products such as speciality anthracite powders, coal dusts, petroleum coke, metallurgical coke and recarburisers.

Sister company Resistant Materials Services (RMS), achieved a Level 4 BBBEE rating. RMS supplies a wide spectrum of products and services into the metallurgical industries. These products and services include exothermic and insulating feeding aids, hot box cores, monolithic castable and ramming refractory products, degassers and fluxes for the non-ferrous metal industries and a wide range of other foundry consumables. RMS is also one of the largest suppliers of ceramic fibre and allied insulation products in South Africa.

Both companies are entities within the RMS Group, which was formed in 1989.

"While we know that there is still much to be done in terms of our sustained transformation journey as we continue to play our role in positively shaping the country's future, these ratings bear testimony to everything that we have worked so hard to achieve to date," said a company spokesperson.

"No company is forced to implement the government's black economic empowerment policy, which is a voluntary programme. However we view this achievement as positive, both for the economic growth of the country and the upliftment of previously disadvantaged people. Economic stability is critical to South Africa and the directors of both Durrans and RMS believe that companies in South Africa must contribute to our economy over and above the normal course of doing business."

"It's our sincere intention to sustain this level going forward by continuing to drive our BEE and transformation agenda."

For further information contact the RMS Group on TEL: 011 917 0702 ■

Cisco to reopen Western Cape steel mill

Steelmaker Cape Town Iron and Steel Works (Cisco) was planning to reopen its Western Cape-based steel mill, following government's move to limit South Africa's reliance on import.

The once-profitable plant shut down in 2010, but following Turkish investment group DHT Africa's acquisition of the unit from Murray & Roberts, plant start-up was "imminent".

Cisco believed that the draft policy to restrict the export of ferrous and nonferrous scrap metal through a mechanism stipulating that domestic consumers are given first right of refusal and preferential prices, tabled by Economic Development Minister Ebrahim Patel, could revive the local steel industry, which requires "all the assistance it can get" as it buckled under economic pressures.

"While unsustainable economic factors contributed to a number of plant closures in the last two years, the newly proposed measures will go a long way to making [steelmakers] viable once again," Cisco spokesperson Ayda Turanli said.

The increase in scrap metal exports de-industrialised the sector and further pressurised the State's infrastructure build programme, as it deprived the country's steel mini mills, foundries and other related processors of quality inputs.

"If the intended controls are made law, then domestic users of scrap will have first offer on ferrous and nonferrous waste and scrap metal at a discounted price and for a period of time, before the scrap can be considered for exportation," Turanli pointed out.

The new levels of discounts offered by scrap market suppliers to local users were expected to rise to about 30% from the current 10% to 15%.

Afrimat extends mandatory offer to Infrasors shareholders

JSE-listed construction materials company Afrimat announced that it was now the controlling shareholder in Infrasors, as from March 1.

At the beginning of February, Afrimat made an offer to acquire a 50.4% stake in Infrasors from Hanchurch Asset Management and certain retiring management of Infrasors, which had been accepted by the sellers.

As a result of Afrimat's holding of Infrasors surpassing 35% of the issued ordinary share capital, it was required, in terms of Section 123 of the Companies Act, to extend a mandatory offer to the remaining Infrasors ordinary shareholders.

Afrimat earlier stated that the acquisition would "complement and augment" its industrial minerals and aggregates product offerings and further expand its geographical footprint across South Africa.

Under the terms of the offer, Infrasors' minority shareholders were entitled to receive 35c per Infrasors share held.

Infrasors further indicated that it was in the process of attending to the challenge of putting in place an independent board, which had been hampered by a lack of directors. The company was also appointing an independent expert, for the purpose of providing a fairness opinion on the terms of the offer.

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Celebrating the life of Chris Stoffberg

"Ductile Dan" passed away peacefully on the 19th February 2013 after a short illness.

Chris Stoffberg was born on the 3rd of June, 1943, and spent most of his youth at the coast in Mossel Bay, Southern Cape where he also met his high school sweetheart Verite. They married after Verite completed her nurses training at the Somerset Hospital in Cape Town and Chris completed his compulsory military training in the Naval Gymnasium at Simons Town, Western Cape.

During his spell in the Naval Gymnasium Chris earned himself an officers commission, as well as being awarded with 'The Sword of Honour', as the best cadet during his training.

Chris' first position in the corporate world was with Union Corporation, at the time one of the big mining houses, which later became Gencor. Chris would later be seconded to Impala Platinum to understudy the CEO, Byng Jackson, to set up the head office infrastructure.

Chris then became responsible for the export of both precious metals as well as base metals such as copper and nickel, before spending time in London to set up and develop a marketing office for Impala Platinum, which resulted in the purchase of an export marketing company, namely Ayrton Metals.

In 1975 Chris decided that it was time for him to move on. He resigned from Impala Platinum and founded his own company, namely Mineral-Loy.

Chris had identified a gap in the local market, which confirmed his belief that the big mining houses neglected the local foundry and steel industries when it came to supplying, in particular, much needed alloys. Being a "people's person", Chris believed that he could be instrumental in filling this void in the market.

To break into this particular segment of the alloy and metals market proved to be more difficult than Chris had anticipated. This temporary setback lead Chris to "containerised shipping", which was still a relatively unexplored field at the time.

However, with Chris' persuasive skills, which he backed up with solid facts, he convinced companies such as Impala Refineries, which he had strong links with, that containerisation was the way to go forward, particularly if one considered the value of nickel and copper.

"I believe that Chris can be credited with the introduction of containerisation at Impala Refineries, particularly when a product called mixed sulphides had to be exported to remote destinations such as Saskatchawan in Canada. This was successfully completed with meticulous precision by Chris Stoffberg and his shipping associates," said close friend and business partner Boet de Beer.

Whilst shipping kept the 'home fires burning' at the Stoffberg household, Chris relentlessly pursued his dream of becoming a player in the metals, alloy and welding electrode industries.

During this period Chris also made a huge breakthrough, when he managed to persuade the Impala marketing team of the time, that he could save them from considerable unnecessary hassles if they entrusted Mineral-Loy with the marketing and distribution responsibilities to the small end users in South Africa for their base metals, of which nickel was the most sought after of the range of products.

By 1985, Chris was a known entity in the local market serving the iron foundries, steel mills as well as the welding electrode industries. This was further enhanced when Mineral-Loy was appointed the South African distributor for Richards Bay Minerals' Sorel Metal (pig iron) products. At the same time the Board of Directors of Richards Bay Minerals appointed Mineral-Loy as the local distributors of other products including Rutile and Zircon used in the welding electrode and ceramic industries.

In order to handle the bigger volumes, secured by the signing of the RBM contract, Chris had to invest in larger premises by purchasing warehouses in Germiston, Gauteng.

Boet de Beer joined Mineral-Loy in April, 1987. "I will always remember Chris's first words when I arrived at Mineral-Loy – 'Boet, you are used to being fenced in a big corporate environment. Here at Mineral-Loy you will find no fences. I know you will find your own way, and I am confident that I made the right choice when I invited you to join me at Mineral-Loy'," said Boet.

During 1987 Mineral-Loy moved from the centre of downtown Johannesburg when the company purchased a stand and built offices in Woodmead Office Park, Gauteng, offices that Mineral-Loy still occupies today.

"Ductile Dan"

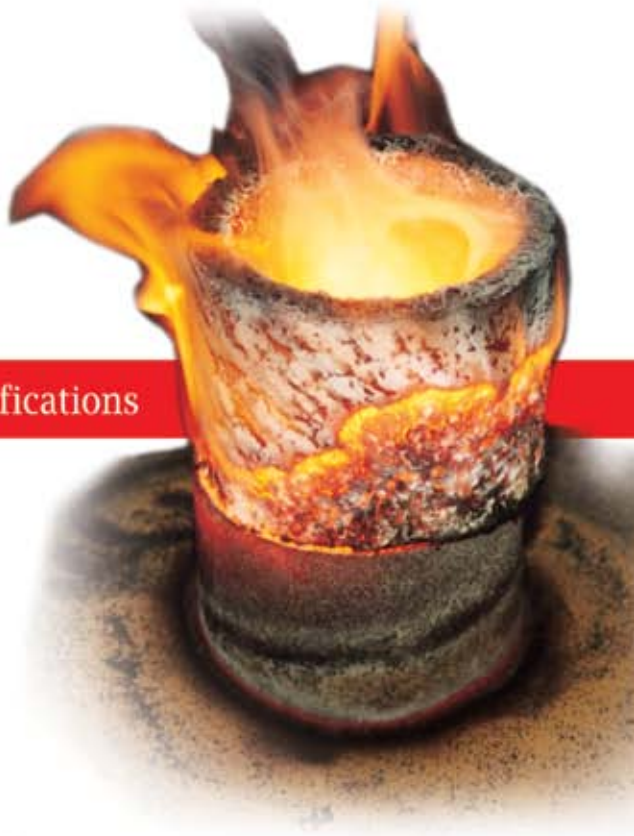
Chris was an advocate of the fact that marketing of the products that he believed in was absolutely paramount, and in his efforts to promote the production of Ductile Iron in South Africa, he created a character called "Ductile Dan". Chris will always be remembered as the original "Ductile Dan" of the iron foundry industry in South Africa.

Foundrymen, past and present, friends and customers will remember his generosity in sponsoring an annual trip for them and their families to stay for a weekend and play golf at Skukuza Camp in the Kruger National Park.

However many will remember the principles that Chris lived by, and those are trust, honesty, sincerity, integrity and faith. Chris was happiest when he could give to those in need and his biggest love in life was most probably children, all children.

Rest in peace Chris and thanks to Boet de Beer, Chris' business partner and friend for providing the information. ■

Foundry consumable products manufactured locally



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Air Products SA agrees to R2.76 million administrative penalty

Industrial and speciality gas manufacturer and supplier Air Products South Africa has agreed to pay an administrative penalty of about R2.76 million to South Africa's competition authorities.

This was part of a settlement agreement with the Competition Commission, in terms of which Air Products admitted that its agreement with Sasol Chemical Industries had given rise to price fixing and market allocation, resulting in the prevention of competition in the industrial gases market.

The penalty represented 1.5% of Air Products' 2011 turnover derived from its liquid nitrogen (LIN) and liquid argon (LAR) products.

Sasol applied for, and was granted, conditional leniency in March 2009. This consent agreement followed a complaint initiated by the commission in September 2009.

The leniency application indicated that Air Products had reached an agreement with Sasol, which limited the extent to which the two firms could compete in the supply and marketing of gas products.

The commission conducted its investigation and found that, during 1998, the two firms entered into a suite of agreements in relation to the supply and marketing of specialty gases.

The agreements included a cooperation agreement, which regulated the cooperation between Air Products and Sasol in the marketing of surplus gaseous nitrogen (GAN), gaseous oxygen (GOX), and LAR and LIN from the Sasol One Oxygen plant; and a supply agreement, which regulated the supply of GAN, GOX, back-up LIN and liquid oxygen (LOX) from Air Products' Vanderbijlpark plant to the Sasol One Oxygen plant using pipelines owned by Sasol.

It further included a management agreement, which regulated the management, operation and maintenance of the Sasol One Oxygen plant by Air Products; and a utilities and services agreement, which regulated the supply of certain utilities and services such as power, water, hydrogen and steam by Sasol to Air Products at the Sasol One Oxygen plant.

These agreements came into effect on April 4, 1998, and were set to expire in April 2013, unless terminated by mutual consent.

The commission found that Air Products and Sasol were competitors in the supply of LAR, LOX, LIN, GOX and GAN, as they were, and continue to be, independent producers of these products and both have plants that have the capacity to produce these specialty gas products.

In addition to the penalty, Air Products agreed to abstain from all anticompetitive conduct, and to develop, implement and monitor a competition law compliance programme incorporating corporate governance, designed to ensure that its employees, management, directors and agents do not engage in future contraventions of the Competition Act.

Air Products further agreed to amend the suite of agreements in conjunction with Sasol to remove the anticompetitive restrictions. ■

State extends powers to speed up 'strategic' projects

The Infrastructure Development Bill, published in March, is designed to speed up "strategic infrastructure" delivery by extending state powers for the expropriation of land and shortening the approval time for projects by government authorities.

The act will grant statutory powers to the Presidential Infrastructure Co-ordination Commission, a multi-ministerial and multilevel governmental body that includes the president, Cabinet ministers designated by him, provincial premiers and the chairman of the South African Local Government Association. The secretariat of the commission is headed by Economic Development Minister Ebrahim Patel.

The act will allow the commission to tie a range of departments as well as all three spheres of government into binding decisions that will expedite infrastructure projects.

The grounds on which expropriation can occur and the terms of compensation are exactly those stated in the constitution. Expropriation can occur only for a public purpose, subject to compensation, the amount of which has "either been agreed by those affected or decided or approved by a court".

To ensure that expropriation and development will not be inordinately delayed by court action, Mr Patel says that the assumption in the bill is that "the state carries on with development even where there is court action. The state will be expected to take that risk."

A second, significant clause in the bill aims to shorten approval times for projects by local and other licensing authorities. The bill aims to cut regulatory decision-making time to 57 days from beginning to end, including the development of plans, public consultation, mitigation plans and final regulatory approval.

This will be done by establishing statutory procedures for the steering committees of a strategic project to closely monitor the application and approval process. Where this does not run smoothly, the secretariat of the commission will have the power to intervene.

One of Mr Patel's chief concerns over the past three years has been the long time lag in infrastructural developments due to regulatory and legal obstacles. One of his favourite examples is a documented experience by Eskom in which it took six-and-a-half years to obtain the land and environmental permission to build a single transmission line.

In a recent interview, Mr Patel elaborated on the progress made over the past 12 months in the government's infrastructural development programme, as outlined by President Jacob Zuma in his state of the nation speech.

Contrary to complaints from private sector construction firms that they are yet to see the benefits of the government's pipeline of projects, R860 billion had been spent since 2009, Mr Patel said.

"We are now starting to complete things and tick them off the list." In particular, he said, the De Hoop Dam in Limpopo and the first phase of the expansion of the Saldanha iron-ore rail line were complete. Both projects preceded Mr Zuma's administration.

Relating to projects initiated since 2009, Mr Patel singled out achievements by both Transnet and Eskom. The construction of the Majuba railway line, a 68km haulage line from Ermelo in Mpumalanga to the Majuba power station in KwaZulu-Natal — for which the "the sod will be turned in the next few weeks" — would be "the first new rail lines laid by the state since 1986".

The laying of 675km of transmission lines by Eskom amounted to "the biggest amount of transmission line laid in 20 years". ■

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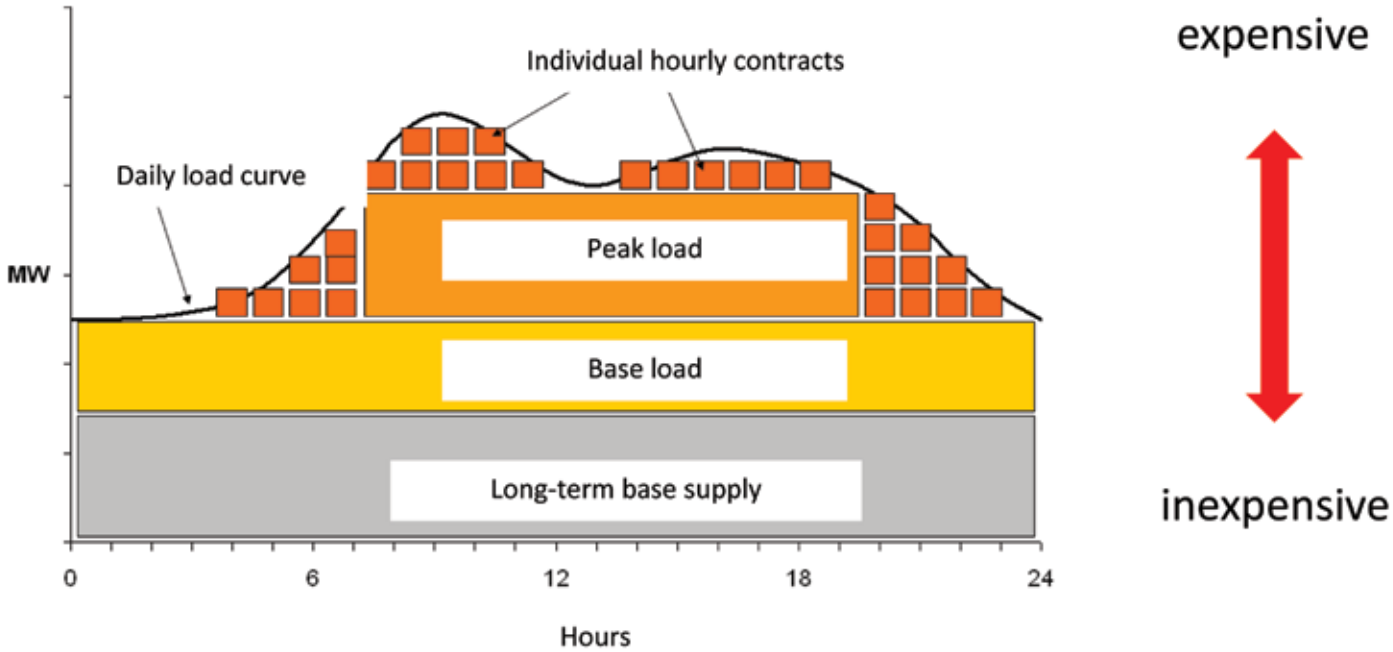

Graph 1: Energy charge breakdown

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BRICS research findings presented

At the last BRICS foundry conference in 2012 delegates expressed the need to create stronger focus areas for discussion. As a result a survey was commissioned to pick out trends and set a context for comparison between the BRICS countries covering topics such as materials and their costs, power sources and usage, cost structures and training within the relative countries.

The survey was commissioned at the end of 2012 by the NFTN and the SAIF and despite the challenges related to language, short time frames for cleaning and checking of data, and countries responding with differing degrees of accuracy, some interesting figures were presented. The study was conducted by Real Consulting.

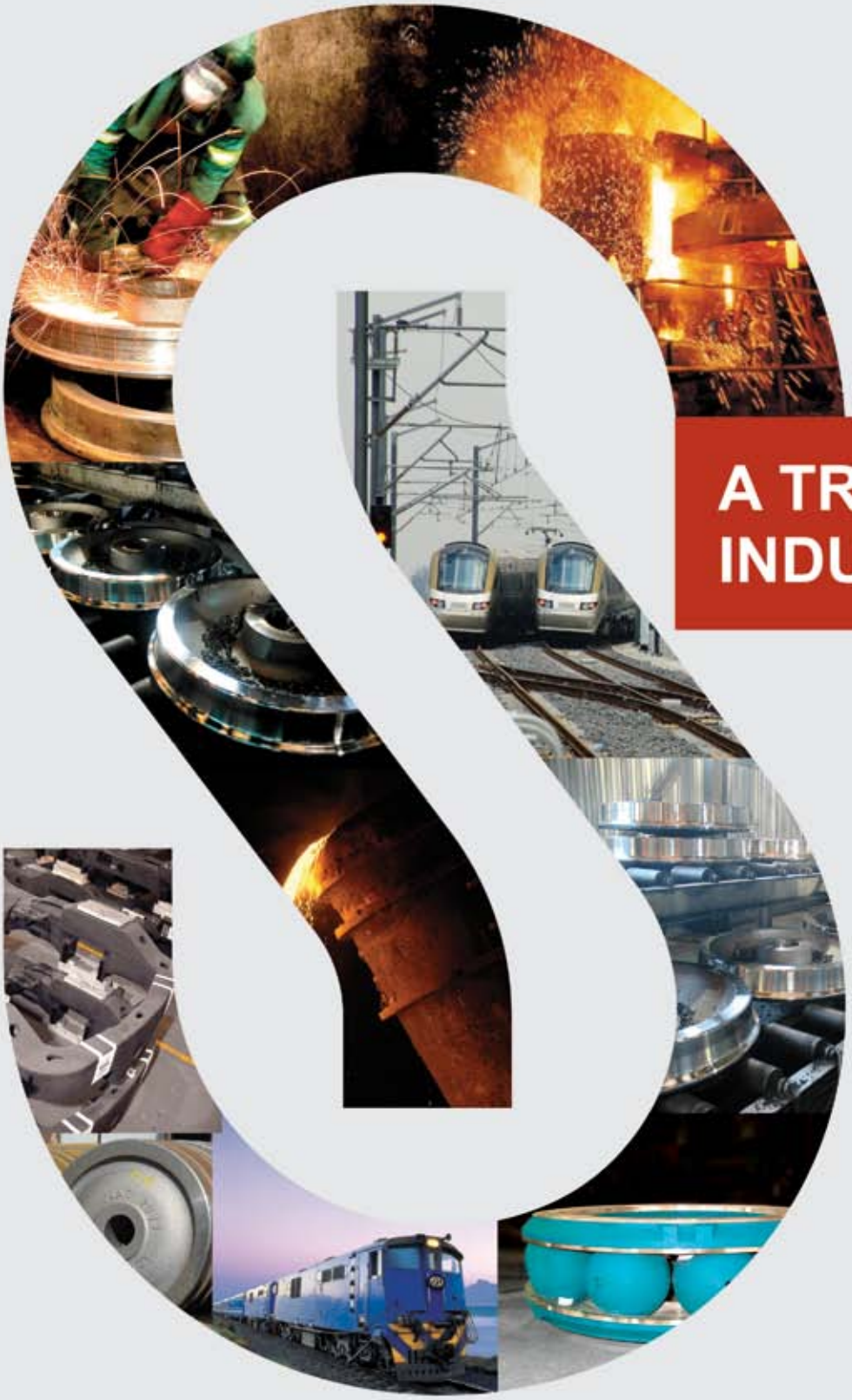
The survey covered China, India, Brazil and South Africa as Russia had recently done an extensive benchmarking exercise.

As iron foundries are significant by output volume, it was agreed to focus this first survey on these foundries. Herewith some of the details to emerge. For the purpose of easier reading I have presented the figures in a format of the largest country first. This might be true in terms of production but it must be noted that for certain of the cost figures this is not necessarily the case.

- **Overall iron production (volume in tons)**
  China 26 million, India 9,1 million, Brazil 2,36 million, South Africa 300 000
- **Number of iron foundries**
  China 16 000, India 4 000, Brazil, 521, South Africa 78
- **Total number of direct and indirect employees**
  China 1,2 million, India 450 000, Brazil 57 600, South Africa 6 618
- **Overall iron production (volume in tons) of the three largest iron foundries in the country**
  China 700 000, India 48 100, Brazil 688 073, South Africa 150 000
- **Market sectors served (percentage). All the countries serve the various sectors to a certain degree. Automotive is generally the largest sector, however in South Africa mining at 33 percent is the largest sector and this percentage is way above those of the other three countries**
  Automotive China 27,8, India 36, Brazil 62, South Africa 21 – Mining 33
- **Average age of furnaces (years)**
  China 6, India 11, Brazil 30, South Africa 25,5
- **Domestic vs Export markets (percentages)**
  China 85/15, India 84/16, Brazil 87/13, South Africa 88/12
- **Average price of alloys per ton (in US dollars)**
  China 1588, India 1213, Brazil 2025, South Africa 1080
- **Scrap average per ton (in US dollars)**
  China 543, India 462, Brazil 380, South Africa 481
- **Resins: Average cost per ton (in US dollars)**
  China 1 579, India 1 565, Brazil 3 350, South Africa 3 633
- **Sand average cost per ton (in US dollars)**
  China 48, India 79, Brazil 20, South Africa 86
- **Average value of castings per ton (in US dollars)**
  China 1 017, India 1 533, Brazil 5 000, South Africa 1 420
- **Material as a % of production cost**
  China 72, India 50, Brazil, 37,5, South Africa 28
- **Energy as a % of production cost**
  China 8,5, India 15, Brazil 11, South Africa 16
- **Electricity cost per kw/h (in US dollars)**
  China 0,172, India 0,160, Brazil 0,165, South Africa 0,171
- **Kw/h used per ton**
  China 639, India 1250, Brazil 600, South Africa 859
- **Electricity cost per ton (in US dollars)**
  China 110, India 200, Brazil 99, South Africa 147
- **Labour as a % of production costs**
  China 8, India 12, Brazil 32, South Africa 33,5
- **Days per annum that foundries operate**
  China 300, India 302, Brazil 250, South Africa 242
- **Equipment as a % of production cost**
  China 8,5, India 8, Brazil 9, South Africa 14,5

You can interpret these figures in a number of ways but what is very evident is that South Africa is lagging behind in a number of areas.

The fourth Foundry Forum will be hosted in India in 2014. ■



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Transnet targets BHP's aluminium smelters

Transnet wants to be first in line to purchase the land at the Bayside Aluminium smelter in Richards Bay, if the world's biggest miner, BHP Billiton, shuts down the operation.

BHP's two aluminium smelters, Bayside and Hillside, are major economic and employment drivers in Richards Bay, but surging production in China and low prices mean the global miner is making huge losses on its aluminium businesses.

The state-owned freight logistics company wants to use Bayside's land to stockpile coal as part of a proposal for a coal export terminal for black empowerment coal miners in the port, which is already the biggest coal terminal in the world.

BHP's vice-president of communication and external affairs, Lulu Letlape, said the company had launched a review process at Bayside to assess the way forward, "but no decisions have been made about the future of the plant".

Transnet's programme director for expansion at Richards Bay, Sudesh Maharaj, said he had heard the Bayside smelter would be closed.

Mr Maharaj said Transnet wanted to buy the land as the site was better suited to stockpile coal for the new terminal.

Transnet's current plan would have put the stockpile further away, on the site of gypsum slimes dams owned by state-owned Foskor.

He said two 5-6 year project proposals for the port, the coal terminal and bigger break-bulk facilities might cost Transnet up to R30 billion.

BHP announced it was concentrating on about 10 assets as it looked for opportunities to divest, to reduce its debt and simplify the business, without naming the assets, Reuters reported.

BHP said its first half profit for the six months to December 31 slumped 43% to $5.68 billion, and it took $3 billion in write-downs on its aluminium and nickel assets.

BHP chief financial officer Graham Kerr said at the time aluminium was expected to remain in over-capacity, production by Chinese producers continued to expand aggressively and the price was expected to remain below the marginal cost of production. The Bayside smelter has been operating at reduced capacity since 2008 after Eskom's demand for a 10% cut in electricity consumption.

Mr Maharaj said the proposed coal terminal would have an initial capacity of 14 million tons a year, rising to about 32 million tons eventually. The aim was to make exports possible for emerging coal producers and to take advantage of expected improvements in rail capacity to Richards Bay from upcountry.

The proposed terminal is situated away from the existing 91 million tons a year Richards Bay Coal Terminal, which is owned by the large groups that use it.

Mr Maharaj said the R15 billion cost estimate of the terminal included operating costs, but Transnet might put the terminal out to tender by a private operator, which could reduce the capital cost by about R8 billion.

The project to expand break-bulk facilities at the port — not yet approved by Transnet — was necessary because of inefficient "criss-crossing" of import and export cargoes, and because demand was expected to rise to 59 million tons a year by 2040, from 23 million now. ■

Glencore, Xstrata deal 'won't affect coal supply in SA'

Developments in coal supply did not favour local coal customers such as power utility Eskom, but the multibillion-rand transaction between commodity trader Glencore and miner Xstrata would not change that, the Competition Tribunal said.

The tribunal was giving its reasons for conditionally approving the transaction in January this year.

The adverse coal industry developments include Eskom's growing demand, an increase in exports, especially to India for electricity generation, and the expiry of the power utility's long-term coal contracts with coal mines.

"These concerns could be addressed by other policy instruments, if government deems it appropriate, and if government wants to ensure that the strategic importance of South Africa's coal reserves to domestic industries is protected," the tribunal said.

Although not specifically mentioned by the tribunal, the government has increasingly been using trade remedies and specific measures to protect local industries. It recently proposed drastic measures to further curtail the export of scrap metal and ensure a steady supply at a price that supports local industry and state infrastructure plans.

Economic Development Minister Ebrahim Patel published a draft policy following concerns that increased scrap exports had been depriving steel mini-mills, foundries and other processors of scrap metal of affordable and quality inputs.

Thembinkosi Bonakele, deputy commissioner of the Competition Commission, acknowledged during a public hearing into the transaction before the tribunal that the problems had to be addressed at policy level.

The tribunal said that higher prices and concerns about the availability of coal for electricity generation were occurring separately from the merger. The deal was unlikely to make matters worse.

Glencore has worldwide activities in mining, smelting, refining, processing and trading of metals and minerals. Xstrata produces coal, ferrochrome, copper and zinc.

The tribunal urged the Competition Commission to use its advocacy role to engage all stakeholders, "including policy makers", about the concerns and their causes to find remedies to protect domestic industries. ■

Metal Casting Conference
provides networking opportunity for foundry industry

The recent Metal Casting Conference, which took place in March at the Kwa Maritane Bush Lodge in North West, provided a unique forum for delegates from Brazil, USA, China, India, Spain, Russia, South Africa, Poland, Germany, UK, Germany, Japan, Denmark and Czech Republic to network and discuss the latest international and national technological developments in the foundry industry.

Keynote speaker Alfred Spada, Publisher and Editor-in-Chief of Modern Casting, a publication of the American Foundry Society, opened the conference with an assessment of the strengths and weaknesses of the global metal casting industry.

A number of speakers from international supplier companies shared their views on the latest trends that they could offer foundries in the drive to reduce costs, provide solutions for waste in the foundry sector, energy efficiency and compliance with environmental regulations.

Third BRICS Foundry Forum

The conference was preceded with the third BRICS Foundry Forum – a forum made up of three representatives each from Brazil, Russia, India, China and South African official foundry bodies. The delegates focused on factors that are driving change in the foundry industry with a view to maximising the learning between the various participating countries.

The Forum is held at one or two-year intervals and is aimed at supporting the industry activities of the organising country. Other issues on which the Forum focuses include sustainable approaches to foundry industry development, technique refinement, practical approaches to the reduction of pollution, foundry clustering and occupational health and safety.

A representative from the Brazil, Russia, India and China associations each presented a paper at the conference.

The conference ended with a game drive and bush braai, which I am sure all the international delegates enjoyed.

Both events were co-hosted by the NFTN, the South African Institute of Foundrymen and the University of Johannesburg. ■

Karien du Plooy and Paul Ochs, both of Saveway Furnace Monitoring Africa

John Bryson of Kimberley Engineering Works Foundry, Mike Killian of Intocast and Scott Melville of Cerefco

Dr Tony Patterson, Freddie Hersleman of DTI and Warren Zandberg of Foseco South Africa

Alfred Spada of Modern Casting and Andrew Turner of The World Foundry Organisation

Carlos Palinhos of RelyIntracast, Lance Deysel of PDC and Andrew McFarlane of Ametex

Bob Stone, Gary Munn and Dave Barry, all of Zimalco with Mark Krieg of AFSA second left

Ben Dyson of Malleable Castings with Marco Rische and Byron McCall, both of ABP Induction

Justin de Beer of UJ, Mark Wynne of Foseco South Africa and Graham Evans of Independent Minerals Distributors

Dr Dieter Heumanns Kaemper, Eddie Short, Brandon Kruse and Mirco Pavoni, all of MorganMMS

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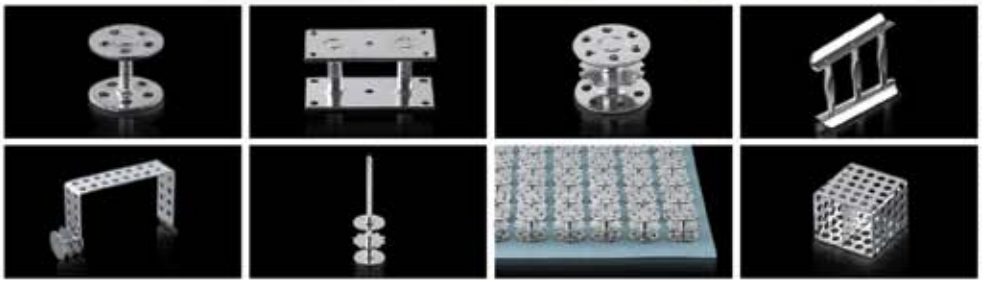

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3D printing may shape a new manufacturing revolution

Additive manufacturing, more commonly known as three-dimensional (3D) printing, is consumer and industry ready. It is gaining momentum as a viable tool for home use and the manufacturing of parts, from scissors handles to titanium aircraft spares.

Early examples of 3D printing emerged in the 1980s, but the printers were large, expensive, difficult to acquire and limited in what they could produce, explains Vaal University of Technology (VUT) Science and Technology Park professor Deon de Beer.

The process of additive manufacturing, laser additive manufacturing (LAM) and 3D printing is a layer-by-layer technique of producing 3D objects directly from a digital model, using computer-aided design (Cad) or animation modelling software. Modern 3D printers melt the material before it is extruded and layered onto the printing surface to form the object it is programmed to print.

The technology can be used to produce spare parts for nearly every object ever made, making the revival of discontinued products possible, as it can be designed on Cad software and subsequently printed.

The term '3D printing' was coined by Massachusetts Institute of Technology's (MIT's) Professor Ely Sachs, who recruited MIT graduates Jim Bredt and Tim Anderson to develop a reliable and commercialised method based on a desktop inkjet printer modified to extrude a binding solution onto a bed of powder, instead of extruding ink onto paper. The ensuing patent led to the creation of modern 3D printing and the creation of modern 3D printing companies Z Corporation (founded by Bredt and Anderson) and ExOne.

The technology is used in the fields of jewellery making, footwear prototypes, industrial design, architecture, engineering and construction; in the automotive, aerospace, dental and medical industries; and in education, geographic information systems and civil engineering.

Endless possibilities

The possibilities of the applications of 3D printing are endless, as research and development (R&D) on the materials that can be used is ongoing and, currently, the materials that are used include polyurethane rigid foam, alumide, polyamide, acrylonitrile, polylactide, fibreglass, carbon fibre, polyresins and various metal powders, such as steel, titanium and aluminium.

In South Africa, the Council for Scientific and Industrial Research (CSIR) National Laser Centre (NLC) is conducting R&D on a suite of metal LAM processes and systems that are expected to benefit the local manufacturing industry by enabling the manufacturing of fully dense metal components from constituent metallic powders.

The goal of the CSIR's additive manufacturing programme is to advance the knowledge, capabilities and economic opportunities in the South African industry.

LAM is key in the beneficiation of South Africa's titanium resources and efforts are in place to establish a viable titanium component manufacturing industry that will enable the local aerospace industry to have a competitive international advantage.

The CSIR is focusing its resources on LAM to identify critical components and industries that can benefit from the technology.

A high-speed, large-area selective laser-melting programme is in place to establish a first generation of equipment capable of building aerospace components with dimensions equal to or smaller than 2 m by 0.6 m by 0.6 m.

The third programme of the CSIR entails working on an ultra-high-speed LAM, which aims to create systems to meet future market demands once LAM has successfully been introduced onto the market.

"Successful completion of the CSIR's initiatives will enable a new knowledge base and capacity that will generate sustainable opportunities in additive manufacturing," says NLC contract R&D manager Francois Prinsloo.

The cost of rapid prototyping technology is plummeting, which presents new opportunities for entrepreneurs who find the technology surprisingly easy to use. Hobbyists are using machines that are bought in kit form. They build the printer themselves, enabling them to print their own figurines. One possibility for the at-home kit is to interest the youth at an earlier age.

Looking local

VUT runs an initiative called the Idea 2 Product Lab, which emerged from the need to have an affordable and customisable platform to support innovators. It is an affordable setup that enables interaction with clients, even in rural areas, as they seek to develop a product. The lab is operated in a scientific manner, using the format of an experiment by

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constantly searching for a mode that is suitable for the client and the laboratory. VUT is also developing a mobile laboratory concept to increase rural impact.

The objective of empowering students and communities to develop their ideas into a prototype has a dual focus – the generation, refinement and improvement of the initial idea and the culmination of the idea into a physical prototype.

The 3D printing industry in South Africa is beyond the rapid prototyping stage, where entrepreneurs can develop a prototype of a product they wish to make. Production can now go into the final par-quality materials. The Rapid Product Development Association of South Africa was launched during its first yearly international conference, hosted by the CSIR in 2000, following several national meetings to establish a community of practice.

"South Africa had a late start with rapid prototyping on 3D printers. The first system was available in 1990 and it had increased to only three systems in 1994," says De Beer.

The first machine was brought into South Africa through an initial investment by Tshwane University of Technology manager of the Institute for Advanced Tooling Bob Bond, and so the adoption of the technology started, supported by a group of private investors under US-based manufacturers 3D Systems and Rapid Design Technologies, followed by research at universities and supported by technology transfer programmes and industry- awareness workshops.

Additive vs subtractive

Prinsloo explains that the difference between additive and subtractive manufacturing is that the latter involves the removal of material from a substrate to create the desired component. This can result in up to 90% of the original material being wasted. In contrast, additive manufacturing limits wastage as the desired component is grown into a near-net shape that requires very little post-machining.

LAM and additive manufacturing are used in the aerospace and automotive sectors, as they provide cost-effective solutions to the refurbishment, repairing and manufacturing of spare parts.

LAM is one form of additive manufacturing and is also known as laser cladding, laser metals disposition, selective laser sintering and direct laser sintering.

Though slightly different, all the processes involve depositing metal powder on a substrate and then melting the material with a focused beam of high-power laser under controlled atmospheric conditions and eventually creating a new 3D object by building up layers of the material. This process allows the manufacture or repair of metal parts for various applications.

This technology is becoming increasingly popular in the manufacturing and repairing of spare parts for aircraft, motor vehicles and even medical applications. The technology for fixing a part through additive manufacturing offers an affordable alternative to replacing an entire part for local institutions like power utility Eskom, chemicals producer Sasol, steel and mining company ArcelorMittal and transport company Transnet instead of importing or manufacturing a replacement part.

Prospects

De Beer says 3D printers are being tested for use in space and the possibility of these being sent with astronauts on deep-space missions is becoming reality.

In an age where news, books, music, videos and communities are subjects of digital dematerialisation, the development of 3D printing has a bright future in rapid prototyping and in the manufacturing of plastic and metal objects, as well as in the medical, art and space industries, he adds.

Several experimental bioprinters have been built since the 1980s. In Japan, the University of Toyama's science engineering professor, Makoto Nakamura, created a bioprinter that prints biotubing similar to that of a blood vessel and he hopes to develop a printer that can print entire human organs, ready for transplant. R&D on bioprinters is ongoing and there have been some success stories, but the technology will not be commercially available until it has been approved by the various regulatory authorities.

Bredt explains that the trend in 3D printing is motivated by the expiration of many basic patents in the technology. As these technologies become publicly available, small-scale developers will be able to create specialised machines for various niches and develop low-cost alternatives.

De Beer concludes that desktop 3D printers are already available at about R15 000 and are capable of an output in colour and in multiple materials. These devices will provide a solid bridge between cyberspace and the physical world, creating an important manifestation of the second digital revolution.

Partnership eyes production of 3-D-printed cars in two years

A partnership between 3-D-printing pioneer Stratasys Ltd.

and design startup Kor EcoLogic aims to produce the world's first road-ready 3-D-printed car.

RedEye On Demand, a Stratasys business unit that provides rapid-prototyping and direct digital-manufacturing services, said the two firms aim to have the vehicle — the Urbee 2 — on the road in two years.

They plan to build on the success of the Urbee 1 ("Urbee" stands for "urban electric"), a concept vehicle that Stratasys/RedEye and Kor EcoLogic produced in 2011 using 3-D printing.

The Urbee 1 "proved that 3-D printing could in fact produce large, strong parts that meet accurate specifications of a car body," RedEye On Demand said in a news release.

"Urbee 2 will take the basic concepts of Urbee 1 to a higher level, including features like a fully functioning heater, windshield wipers and mirrors," the company added.

Winnipeg, Manitoba-based Kor EcoLogic — headed by mechanical engineer and consultant Jim Kor — will fully design the Urbee 2 in CAD files, sending them to RedEye On Demand for production through Stratasys's fused-deposition modeling process.

The process applies thermoplastics in layers from the bottom up, yielding parts that are durable, precise and repeatable, according to the firms.

They said production of the Urbee 2 will require only 40 parts.

'Anything really is possible'

When finished, the two-passenger vehicle will be able to travel at speeds up to 70 mph, powered by 100 percent ethanol or a similar biofuel, the firms said.

Their ultimate goal: driving the Urbee 2 from San Francisco to New York City on 10 gallons of fuel, setting a new world record.

"A future where 3-D printers build cars may not be far off after all," said Jim Bartel, Stratasys vice president of RedEye On Demand.

"Jim Kor and his team at Kor EcoLogic had a vision for a more fuel-efficient car that would change how the world approaches manufacturing and today we're achieving it. Urbee 2 shows the manufacturing world that anything really is possible. There are few design challenges additive-manufacturing capabilities can't solve."

Kor, who has led both Urbee projects, said the Urbee 1 showed him that "product design is nearly unencumbered by considerations on how parts can be made with digital manufacturing."

"That liberation is incredibly powerful and holds a lot of potential for the future of manufacturing," Kor said. ■

This article first appeared in Engineering News. Pictures courtesy Stratasys.

Rio Tinto to raise iron ore production in 2013

Global miner Rio Tinto aims to boost iron ore output by 15 percent this year after production in 2012 climbed to 253 million tons.

Global miner Rio Tinto aims to boost iron-ore output by 15% this year after production in 2012 climbed to 253 million tons, beating its own guidance, as resurgent Chinese demand drives a price recovery.

Rio Tinto, the world's second-biggest producer behind Brazil's Vale, has stuck to an aggressive expansion plan in iron ore even after the market was rattled for much of last year by concern about top buyer China.

"Markets remain volatile, but our business continues to perform well," Rio Tinto CEO Tom Albanese said in the company's fourth-quarter production report.

Rio had set a target of 250 million tons in 2012 after producing 245 million tons in 2011.

The company, which derives more than two-thirds of its revenue from iron ore, resisted trimming back its expansion plans despite a prolonged weak period in the sector last year, confident its rich ores and low-cost operations would provide adequate profit margins throughout the cycle.

Rival BHP Billiton cancelled a multibillion-dollar port expansion in Australia in 2012, opting to make do with smaller plans to allow more ships to load its ore.

Little tolerance

At the same time, Mr Albanese has said the group would show little tolerance for under-performing businesses. Rio Tinto has already isolated its highest-cost aluminium division under Pacific Aluminium in hopes of a whole or partial sale.

It has spelled out plans to reduce costs by $5 billion by the end of 2014 and also cut exploration spending by $1 billion.

"Across the group we are taking action to roll back unsustainable cost increases. This further enhances our resilience and competitive edge as we enter 2013," Mr Albanese said.

Iron-ore prices have soared more than 80% since September's low point as Chinese steel mills — the single biggest buyers of seaborne-traded ore — returned to the market on signs of a recovery in the Chinese economy.

Benchmark prices hit a 15-month high of $158.50 a ton, as China's iron-ore imports topped 70 million tons for the first time in December, helped by a resurgent economy and a cold snap that cut local production.

Iron-ore prices have started to retract, however, suggesting a peak in the recent cycle, though analysts are not expecting a return to levels below $100 a ton, which could threaten production from more marginal producers.

Rio Tinto stands to benefit the most from a healthy ore market, given its average production costs of below $30 a ton and heavy weighting to the sector versus its other business units.

A $10 a ton rise in the iron-ore price can increase Rio's full-year earnings by more than 10%.

UBS is forecasting a drop in Rio's earnings before interest and tax to $13 billion in 2012 from $15.3 billion in 2011 after iron-ore prices came under pressure for most of last year.

In the past month, iron ore has rebounded by about a third, although a further rally will hinge on whether Chinese demand out paces the rise in global supply this year.

Rio is targeting an annual production rate of 290 million tons by the end of 2013 before lifting output to 360 million tons in 2015, pending board approval. The tonnage also includes output from the company's iron ore mines in Canada.

It said it had most board approvals in place for the next phase of its expansion work to take output to 360 million tons. That would mean Rio could surpass Vale as the world's biggest producer.

BHP aims to boost output to an annual rate of 220 million tons by financial 2014. ■

International Zinc Diecasting Conference 2013

With 'Tradition and Innovation' as its theme, this two-day conference will review the latest research and development activities in zinc alloys and process technologies which enhance the functionality, design and performance of zinc diecastings and highlight traditional end-use applications as well as new innovative market opportunities.

Speakers will include Dr. Lothar Kallien, Professor, Production Engineering, University Aalen; Martin van Leeuwen, Manager Market & Technical Development, Nyrstar; Annalisa Pola, Engineering Faculty, University Brescia; Didier Rollez, Sales and Technical Service ZAMAK, Grillo-Werke AG; Frank Goodwin, Director, Technology & Market Development, IZA; and Mik Gilles, Manager European Affairs, IZA.

The International Zinc Diecasting Conference 2013 will be held at the Park Inn Hotel in Prague on 13-14 June. The conference will cover the latest research and development in zinc alloys and process technologies enhancing the functionality, design and performance of zinc diecastings and review traditional end-use applications and new innovative market opportunities. The conference will be complemented by the presentation of the winning parts of the European Zinc Die-casting Competition and an exhibition of the conference sponsors.

The International Zinc Diecasting Conference will be of particular interest to diecasters, designers, specifiers, design engineers, representatives of end-use industries and others.

The conference is organised by the International Zinc Association (IZA) and will be held in English. The two-day conference will be subdivided into a technical part and a market-oriented part. A tentative program is available.

IZA seeks proposals for presentations for both parts. Interested speakers are invited to submit their proposals. Please complete the Call for Papers form and return to IZA.

The conference offers a number of sponsorship opportunities. Please view the sponsorship document for specifics.

For further details visit www.zinc.org ■

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Space-Age alloys take off in "Hypergravity"

Overcoming casting difficulties for lightweight, high-strength titanium aluminide.

Researchers at the European Space Agency (ESA) helped in the development of an alloy that is critical to an emerging series of aerospace applications, a material that reportedly is twice as light as conventional nickel-based super alloys, with comparably good properties for strength and heat-resistance. Creating this alloy is very difficult, however. The production process demands particular capabilities that ESA made available to product engineers, namely the ability to conduct research under all types of gravity.

Aircraft and jet engine designers, as well as airlines, want component and system designs that will reduce aircraft weight, in order to save fuel costs, but without sacrificing engine performance or flight safety. According to ESA, cutting an aircraft's weight by 1% will save up to 1.5% in fuel volume. For commercial airlines, this saving could reduce operating costs. For passengers, it might result in cheaper fares and more direct routes. A reduced environmental impact would be another benefit, ESA indicated.

Aerospace engineers understand that titanium aluminide (TiAl) alloys offer weight savings over the Ni-based super alloys in standard use for jet engines. TiAl, is a lightweight intermetallic that resists oxidation and heat, but its tensile strength is low. It is particularly difficult to cast, because of the trouble maintaining conditions for thorough mould filling and reliable solidification.

Engineers note that one specific titanium aluminide compound, gamma TiAl, has strong mechanical properties and oxidation- and corrosion-resistance at elevated temperatures: it can withstand extreme temperatures up to 800°C. These factors indicate TiAl-based alloys have a strong potential to increase the thrust-to-weight ratio in an aircraft engine, specifically in low-pressure turbine blades and high-pressure compressor blades. By contrast, Ni-based superalloys reportedly are nearly twice as dense as TiAl-based alloys.

The use of TiAl in aerospace structures is a relatively recent development: jet engine designer/manufacturer GE Aviation chose TiAl for turbine blades in its GEnx engine, which is installed in the Boeing 787 Dreamliner and Boeing 747-8 cargo jets.

There are some investment casting foundries capable of producing TiAl for low-pressure turbines, but the volumes are low due to the production difficulties, and the commercial applications of the material exceeds its availability. Over 1 million turbine blades will be manufactured in the coming decade, according to ESA, and using TiAl would reduce the components' weight by 45% over current standard materials.

The alloy's benefits may be significant to automaking as well as aerospace applications, the R&D source stated.

Although it is possible to produce the alloys in laboratory conditions, casting it into turbine blades or other critical shapes required by aircraft engine builders is not simple. ESA scientists worked to address the production problem through the Impress project. The Intermetallic Materials Processing in Relation to Earth and Space Solidification (Impress) project investigates materials processing, structures, and properties of new higher-performance intermetallic alloys for industrial applications, such as turbine blades and catalytic powders. It is a joint effort between the European Commission and ESA.

ESA is an intergovernmental agency that conducts research into issues critical to space exploration. With 20 member states and headquartered in Paris, ESA has a staff of over 2,000 and an annual budget of about $5.38 billion.

Gravity's pull

In industrial-scale research, it's common for engineers and

scientists to eliminate as many variables as possible in order to observe basic interactions. Impress researchers working to develop industrial-scale production techniques for TiAl alloys determined they'd need to eliminate one factor that hampered their observations of the material's ductility: gravity. That conclusion led to ESA's involvement.

In space, there is no gravity, so aboard a research rocket launched from Kiruna, Sweden, aluminium samples were heated in a small furnace. During six minutes of free fall, the samples were heated above 700°C and then subjected to X-ray monitoring during the cooling process. From these results, the researchers realized that casting titanium aluminides might require the opposite condition: hypergravity.

"Hypergravity" is the condition in which the force of gravity exceeds that which exists normally on Earth (presented as "1 g" — with g being gravitational acceleration on the Earth's surface.) To understand and define the influence of gravity, ESA concluded that observing effects of microgravity and 1 g is insufficient: the material's performance across a broad gravity spectrum to give a complete picture of its ductility.

So, ESA developed a Large Diameter Centrifuge (LDC), making it possible to collect measurement points in the range from 1 to 20 g.

The Large-Diameter Centrifuge at the European Space Research and Technology Centre at Noordwijk, The Netherlands. The rotation of the LDC creates a hypergravity field inside each gondola. The LDC has an 8-m diameter, with four arms that support up to eight gondolas (two per arm), with a maximum payload of 80 kg per gondola. In practice, six gondolas are available, plus one gondola in the center for control or reference experiments

This instrument provides a hypergravity environment for biological, biochemical, microbiological, opto-physical, physical, material and fluid sciences, geology and plasma physics. The LDC is part of the Life and Physical Sciences Instrumentation and Life Support Laboratory (LIS) at ESTEC in The Netherlands, dedicated to European science and technology research programs.

The LDC has a diameter of 8 meters. It has four arms, each of which can support two gondolas with a maximum payload of 80 kg per gondola. In practice, six gondolas are available, plus one gondola in the center for control or reference experiments. The rotation of the LDC then creates the hypergravity field at the experiment site inside each gondola.

Because ESA is the only organisation that offers all levels of gravity, the Impress team used the centrifuge at ESTEC to test their theory.

Casting TiAl alloys in a centrifuge creating up to 20 times normal gravity helps the liquid metals to fill every part of a mould, producing a perfectly cast alloy, even with complex shapes.

Analysing metal casting in multiple has produced the research details that allowed the titanium aluminide industrial process to be refined, and commercialised. ■

Metso buying Chinese steel foundry

JX plant, plus affiliated fabricating operation, expands capacity to supply wear parts for Asia's mining, construction equipment customers.

Metso Oyj, a Helsinki, Finland-based manufacturer of heavy machinery has acquired a manganese steel foundry in China, aiming to improve its delivery of wear parts to the Asian mining and construction industry. In addition to mining and construction, Metso builds machinery and supplies other services worldwide for pulp and paper operations, energy companies, and oil-and-gas exploration and processing.

Metso already operates five foundries, and the Quzhou Chixin Machinery (JX) foundry, in Quzhou City, Zheijang province, has reportedly been a castings supplier to Metso.

"The acquisitions of JX and Shaorui Heavy Industries Ltd. and the joint venture with LiuGong Group Corp. Ltd, announced last November, significantly strengthen our supply capabilities for mining and construction industries in China," stated Metso Mining and Construction president Andrew Benko.

"Metso now has a complete range of capital equipment and wear parts covering a wide range of customer requirements. By acquiring a new steel foundry in China we are able to better serve the needs of our Chinese customers," Benko continued.

The cost of the new purchases will not be announced, Metso noted. It expects to finalise the purchase within a few months.

Metso is buying the assets of Quzhou Juxin Machinery Co. Ltd (JX) and Quzhou Chixin Machinery Co. Ltd from the current owners. Founded in 1987, JX has a 12,000-sq.m. plant on a 30,000-sq.m. site, and produces up to 15,000 metric tons/year of castings. The operation is ISO9001:2000 certified, and includes a melt shop, moulding lines, machine shop, heat-treating equipment, and an inspection lab. According to Metso, the foundry and its affiliate (a fabricating and marketing operation) have a total of 275 employees.

The foundry produces high-manganese steel castings, including mantles, concaves, jaw plates, hammers, and wedge plates; high-chromium alloy iron castings, such as wear-resistant rings for coal milling machines, impact hammers, and impact plates; and carbon steel castings, such as crusher bottom shells, top shells, and straight gears.

Most of the JX foundry's products are produced for export. In addition to Metso, it lists Sandvik SRP, Trio Crusher, Shenzhen Deyuansheng, North Industry, and Juhua Group as customers.

Metso's other foundries are in Ahmedabad, India; Isithebe, South Africa; Prerov, Czech Republic; Sorocaba, Brazil; and Tampere, Finland.

Metso has been in business in China for 80 years, and recently established a joint venture with LiuGong Group Corp. Ltd. to manufacture construction equipment. Late last year, it purchased Shaorui Heavy Industries Ltd., a mining equipment manufacturer.

"We already have the most extensive services hub and distribution network in our industry," stated Metso's João Ney Colagrossi, president of the Mining and Construction Services business line.

"With this acquisition we will strengthen our manufacturing presence in China and further develop our services business. We will improve our capability to supply wear parts to our mining and construction customers close to their operations and increase the flexibility and resilience of our wear products supply chain. We intend to use the acquired site as a platform to further develop our services capabilities in China," he added. ■

New technology allows steel, aluminium to be joined, says Honda

Japanese car manufacturer Honda Motor Company has announced that it has developed a technology that allows steel and aluminium to be joined.

Honda says the innovation will allow it to manufacture weight-saving vehicle doors that combine a steel structure with an aluminium outer skin.

Joining together dissimilar metals may sound simple, notes the company, but required a combination of no less than three separate new technologies to enable the production of doors with aluminium outer panels.

These include, firstly, a proprietary '3D Lock Seam structure' (3DLS), which involves mechanically joining steel and aluminium panels through twice-over layering and hemming.

In addition, Honda had to use a highly anticorrosive steel for the inner panel, while developing a different panel shape that would ensure that the gap between the inner and outer panels could be filled with an adhesive agent.

Finally, thermal deformation was prevented by employing an adhesive agent with a low elastic modulus, while the position of the 3DLS system was also optimised to address deformation.

By developing and using these technologies, Honda was able to eliminate the spot-welding process required to join conventional steel door panels. At the same time, the new processes could be implemented on existing production lines.

Honda says the technologies form part of its "ongoing commitment to improving the fuel economy and the dynamic performance of its vehicles".

The new steel-and-aluminium doors are around 17% lighter than a normal steel door panel.

Further, since the weight is trimmed from the lateral extremities of the vehicle, the centre of gravity becomes more centralised, which benefits stability and handling, adds the company.

It notes that the new weight-saving technology represents the latest in a series of efforts to reduce vehicle weight "in the interests of lower emissions and greater efficiency".

Honda's Acura luxury brand will be the first to adopt the new technology when the new Acura RLX goes on sale in the US, but its application will be expanded to include a growing number of Honda models worldwide. ■

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Insimbi's core business is supplying the metal industry, and by design and organic growth the company has diversified its product offering and caters for the following industries as well.

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This division is constantly seeking new and innovative solutions for our customer base

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Ferrous and non-ferrous alloy products required in the steel and stainless steel melting production process ranging from cored wire, fluorspar; FeMn, magnesium and aluminium

Specialty products
Supplies welding powders, optical consumables, cobalt sulphate and carbon products to a diverse spectrum of industries

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Supplying ore, ferro alloys and metals on a global scale

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Manufacturer and supplier of both steel and polypropylene fibres into the concrete and monolithic refractory industries

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This newly introduced division supplies quality coating powders into the metal finishing industries

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We specialise in the design and supply of refractory products to the metals and furnace building industry

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- Insimbi Technical Textiles specialises in the manufacture and supply of high temperature insulations materials into a wide variety of industries.
- Metlite Alloys is a producer of quality aluminium ingots and deoxidants.
- Insimbi Aluminium Alloys is a producer of quality deoxidants.
- Insimbi Nano Milling develops, manufactures and distributes nanosized products and composites.

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A visit to a Taiwanese foundry

I recently returned from a visit to the Taiwan machine tool show, TIMTOS.

Besides the usual stand visits to find out about the latest trends and new equipment, I was taken to see several manufacturing facilities, including the foundry of Victor Taichung, one of Taiwan's leading machine tool builders based in the country's manufacturing region in Taichung, about two hours south of Taipei.

In central Taiwan there is an area where over a thousand precision machine companies and tens of thousands of downstream suppliers reside. Called the Golden Valley, it covers approximately 60 square kilometers, and supplies many of the world's hi-tech businesses, reported the Taiwan-based Business Weekly. It has the world's highest density of precision machine companies, employing 300,000 people with an annual production value of NT$900 billion (US$30 billion).

Without the businesses found in the Golden Valley, the global consumption of one billion iPhones this year would be cut in half and the solar plant owned by Google in the desert would be offline. Without this dynamic region, the semiconductor and display panel industries would face a broken supply chain since the top four equipment suppliers of semiconductors and flat panel displays depend on companies in this area for their components.

A mould during the preparation stage

Plus, German and Italian auto-parts companies rely on the mechanical equipment produced here. In the automotive industry, General Motors (US), Porsche (Germany) and Hyundai Motor Company (South Korea), all buy their gear wheels from the Golden Valley. Even China, the largest auto market in the world, is dependent on this area to provide tooling and processing equipment.

For one, Taiwan's machine tool industry is advancing. The machine tool builders I saw at the show this past March say they are focused on improving the performance, capabilities and quality of their offerings while maintaining their traditionally low unit costs. This was evident in the selection of machines featured at the show, which, I must admit, included more five-axis and turn-mill offerings than I thought I'd encounter. There was also a noticeable selection of large machines, such as horizontal boring mills and vertical turning centers geared toward big oil and aerospace applications. And in addition to integrating more advanced machining capabilities into their designs, many builders explained that they are focused on developing more energy-efficient models. Increasingly aggressive R&D programs have helped in these efforts, supported by shared research parks that have been formed for some of the machine tool builders.

Taiwan's machine tool industry is growing, too. According to the 2011 World Machine Tool Output and Consumption Survey compiled by Modern Machine Shop publisher Gardner Publications, Taiwan now ranks sixth in total production of machine tools and fourth in machine tool exports.

Coating of the mould

Different moulds being prepared

The Backbone of Ceramic Fibre

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- Ceramic Fibre Modules
- Ceramic Paper
- Insulation Boards
- Calcium Silicate Boards
- Vacuum Formed Products
- Mixes, Cements & Coatings
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Email: rms@rmscc.co.za
Tel: +27 (11) 917 0702

Cape Refractory Industries
Email: cri@mweb.co.za
Tel: +27 (21) 982 7484

Natal Refractories (Pty) Ltd
Email: nrdbn@iafrica.com
Tel: +27 (31) 468 1474

Contact the company closest to you.

A pour taking place

Most of the scrap metal arrives sorted and bailed

Approximately 75 percent of machine tools produced in Taiwan are exported. Not surprisingly, China is Taiwan's main focus for machine exports. With the signing of the Economic Cooperation Framework Agreement (ECFA), which aims to reduce tariffs and commercial barriers between the Chinese and Taiwanese governments, machinery exports to the Mainland are likely to increase. However, Taiwanese machine tool builders are also looking to emerging markets such as Turkey, Brazil and Russia.

The United States remains one of Taiwan's top export markets. Many of the models installed here are private-labeled by more familiar German, Japanese or American machine tool companies. That said, some Taiwanese brands are very familiar names. These include Feeler (Fair Friend Group), Victor Taichung, Goodway, Leadwell, Tongtai, You Ji and others.

Taiwanese machine tool builders tend to be relatively small, family-owned businesses, but they are well-supported by the national government. This is because the government recognises that manufacturing and machine tool building is vital to the island's economic growth and development.

Getting up to speed on the Taiwan machine tool industry

Machine tool builders in Taiwan are striving to increase equipment capabilities while keeping unit prices down.

Here are a few interesting points

- Taiwan is the world's sixth largest machine tool producer and fourth largest exporter.
- Approximately 75 percent of the island's machine tool production goes to the export market. Taiwan's export sales of machine tools are estimated to hit a record high of U.S. $4.2 billion in 2012. Exports to the US increased by 21.6 percent in 2010, ranking second only to China.
- The machine tool industry is the country's most important industry by value. There are more than 500 machine tool manufacturers in Taiwan, with most situated in the Taichung area.
- Taiwan is among the world leaders in machine tool production despite its size. Taiwan has 23 million people living on an island with an area 36,188 km^2, just under half the size of Mpumalanga Province.

A general view of the foundry

Victor's foundry in Hou-Li in Taichung city

Recognising the importance of castings quality, Victor Taichung established a foundry in early 1973 to support its own utilisation and assure the products consistency. By cooperation with Meehanite Metal Co. and importing the process management system in 1986, the Victor foundry took a giant leap forward whereby it could offer other machine tool builders, both locally and internationally, machined castings.

Meehanite® cast iron

The foundation of any machine tool is the base and this must offer rigidity, strength and above all else high damping properties. These characteristics are best found in quality nodular grey cast iron, produced in Victor's own ISO-9001 certified foundry. All castings are made following the Meehanite process, recognised worldwide as the quality mark for good castings. Castings manufactured are mainly for industrial machine tools including the beds, saddles and frames but they also cast cylinders, gears and bearings for the automotive industry, as well as general machine castings.

Ductile cast iron

The foundry also manufactures castings in ductile cast iron for industrial machine use, automotive castings such as cylinders, crank shafts, gears, bearings, castings for the plastic injection moulding machine division and castings for the valve and pump industries.

Equipment

The foundry has for some time operated under the furan no-bake moulding system, has one four ton water cooled type

Different views of the melting platform

cupola furnace and three 1 500kW three ton high frequency induction furnaces capable of producing an output capability of 1 200 tons per month.

The melting composition and specifications are subjected to C, Si, CE value, wedge inspection and physical testing, in addition to penetrating casting texture vacuum emission spectrometer and metallurgical microscope.

Castings are generally done in the 10 ton region although the foundry is capable of manufacturing 20 ton castings.

Investment castings

Victor Taichung's Hou-Li Meehanite licensed foundry can also produce up to 50 tons of investment casting components per month.

This type of production is ideal for smaller intricate components like Victor Taichung's valves as it produces a fine matt finish and most importantly can allow tight tolerances. Not only does Victor Taichung make use of the investment capabilities of the Hou-Li plant but also such industries as sports and leisure equipment, catering equipment, sanitation and military hardware.

Victor Taichung Machinery in Taichung is an unusual company because it is one of only two firms in Taiwan to have its own foundry. Unlike many Taiwanese companies that just assemble machines, Victor Taichung builds its CNC and injection-moulding machines from the ground up, using its own castings and spindles. The company also uses the Japanese concept of multi-tasking machines, which do both milling and turning at the same time, on its own products.

Victor Taichung Machinery Works Company was established in 1954, and started its business by making conventional lathes.

Taiwan is a very important castings market, ranking 12th in world casting production, with an output of 1,447 million tons a year

For further details contact Victor Fortune on TEL: 011 392 3800 ■

Completed castings ready for delivery to the Victor Taichung machine shop and assembly facility, also based in Taichung. Victor Taichung Machinery in Taichung is an unusual company because it is one of only two firms in Taiwan to have its own foundry. Unlike many Taiwanese companies that just assemble machines, Victor Taichung builds its CNC and injection-moulding machines from the ground up, using its own castings and spindles. The company supplies other machine tool builders, both locally and internationally, with machined castings

Elkem to feature new ductile-iron practice at CastExpo '13

A new magnesium-treatment practice that improves the production of ductile iron will be featured in Elkem Foundry Products booth at CastExpo '13 in St. Louis in April. The new practice gives a quieter reaction, increases magnesium recoveries, and lowers costs.

A videotape comparing the new practice with conventional ductile-iron treatments will be shown at Elkem's CastExpo booth. Elkem's metallurgically trained sales representatives will also be available to discuss the new treatment process as well as Elkem's design improvements that enhance its benefits. Elkem's representatives can also provide information on the company's unique line of inoculants and nodulisers designed to optimise grey- and ductile-iron properties.

Elkem's high-performance SUPERSEED® inoculant maximises chill reduction in grey iron, giving superior machinability, reduced shrinkage, and higher strength in castings

More efficient magnesium treatment of ductile iron

The new magnesium-treatment practice uses Elkem's LAMET® noduliser and TOPSEED™ cover alloy to treat molten iron and create the desired ductile-iron nodular-graphite microstructure. When iron is poured into a specially designed ladle containing these alloys, the normally explosive reaction with magnesium does not take place right away. Once it starts, the reaction is much quieter and takes almost twice as long as conventional treatments with less spilling, fume, and slag. This slow reaction allows foundries to recover more magnesium from the noduliser and obtain a well-inoculated iron with good nodularity.

In typical photos below, the quieter reaction obtained from using Elkem's LAMET® noduliser and TOPSEED™ cover alloy is compared with a conventional practice using magnesium ferrosilicon and 75% ferrosilicon. The photos were taken 15 seconds and one minute, respectively, after iron started to pour into the treatment ladle.

By taking advantage of the ladle-design improvements offered by Elkem, ductile-iron foundries can also reduce temperature losses, fill the ladle faster, delay the release of magnesium, significantly improve magnesium recoveries, and obtain desired ductile-iron microstructures.

Complete line of inoculants and nodulisers

Elkem's CastExpo booth will also feature the company's complete line of high-performance inoculants and nodulisers in the full range of grades and sizes needed to produce grey and ductile iron. These speciality products offer many foundry benefits, including their ability to control graphite shape and size, influence the ferrite/pearlite matrix ratio, eliminate surface chill and internal carbides, minimise shrinkage, optimise mechanical properties, and increase machinability.

For example, Elkem's high-performance SUPERSEED® inoculant maximises chill reduction in grey iron, giving superior machinability, reduced shrinkage, and higher strength in castings. Also, Elkem's thin-cast LAMET® noduliser gives higher nodularity in ductile-iron castings than regular magnesium-ferrosilicon. The alloy also reduces scrapped castings from shrinkage, gives a better machined surface, and produces higher strength castings compared to conventional nodulisers.

Elkem's extensive research-and-development program is continually working on new high-performance, problem-solving materials that will improve the production and properties of grey and ductile iron.

For further details contact Ceramic & Alloy Specialists on TEL: 011 894 3039 ■

Violent reaction from conventional treatment practice

Quiet reaction from Elkem's new treatment practice

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Q4 TASMAN has various intelligent innovations implemented to achieve unmatched performance:

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Q4 TASMAN's superior analytical performance and economical run is a great asset for your metal business!

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Determine inclusions in steel spectroscopically

New whitepaper and webinar available.

With the Spectrolab stationary metal analyser and Single Spark Evaluation (SSE), Spectro Analytical Instruments now offers a real alternative to microscopic determination of inclusions in steel.

Inclusions in steel greatly influence its mechanical properties. In free-cutting steel, for example, inclusions of manganese sulfide (MnS) are desired, as they ensure that filings break easily during processing. In other steel alloys, however, inclusions can negatively influence the value of the material. This is why monitoring the concentrations of the alloying components during steel production is not enough. It is just as important to obtain information about type, size and distribution of inclusions as quickly as possible.

Conventional microscopic testing for inclusions provides accurate results, but the samples must be ground extensively and polished before they can be examined. Use of a top quality optical emission (OE) spectrometer, such as the Spectrolab—Spectro's flagship OE spectrometer, is a practical alternative with several key advantages. With Spectrolab, for example, it is possible to exactly determine the concentrations in alloys and to draw possible conclusions about correlations among the elements.

With Single Spark Evaluation, a sample is bombarded with single sparks in a "mapping" measurement. Most of the sparks hit the normal metal matrix, which results in a picture of the alloy composition. However, when a spark hits an inclusion, the measured values are different. From this deviation in measured values, it is possible to determine the presence and chemical composition of an inclusion and to even calculate its size. In this way, OES-SSE technology is able to quickly deliver qualitative and semi-quantitative results.

Free white paper and webinar available at www.spectrolive.com

Available for download at www.spectrolive.com is a new whitepaper from Spectro detailing SSE technology

The whitepaper outlines how to use SSE technology with the Spectrolab and compares the measurement results from MnS inclusions in steel acquired using SSE to the K1 table according to DIN 50602. The paper describes how it is possible to calculate values to characterise the purity of the steel with Single Spark Evaluation that correspond to those with the K0 test according to DIN 50602 and how it is possible to determine the size and number of OG-type inclusions in pure steels that have a negligible portion of inclusions larger than class 3.

For more information contact Spectro Analytical Instruments on TEL: 011 979 4241 ■

Fired refractory shapes

Offer resistance to chemical attack from acids, slags, and gases to produce the cleaner metal for aerospace, automotive castings.

Morgan Thermal Ceramics has announced the availability of Cerox® fired refractory shapes 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% 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 recommended for products with complex shapes, including crucibles, tundishes and launder systems.

For complex shapes, Cerox 720, which also features a 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% product inspection, these high-quality components are ideal for the most demanding of high-temperature environments.

For more information contact Morgan Thermal Ceramics South Africa on TEL: 011 815 6820 or visit www.morganthermalceramics.com ■

Compact thermometer Easytemp TMR31/35

Endress+Hauser's economically priced compact thermometers offer a number of benefits. They can be installed quickly and are easy to operate.

The products TMR31 and TMR35 of the Easytemp line are compact thermometers for temperature ranges of -50°C...150°C (without neck) and -50°C...200°C (with neck).

The TMR31 has been designed for general use and the TMR35 for hygienic applications. The sensor element is a Pt100 with a class A accuracy. The measured temperature is transmitted either directly as a 4-wire Pt100 connection or as a 4 – 20mA signal using the transmitter integrated in the housing.

The devices can be ordered with predefined parameters or they can be set up using the ReadWin 2000/ReadWin Quicksetup software. When using ReadWin 2000 a number of additional features are made available such as "Sensor-Transmitter-Matching". With this the thermometer accuracy can be improved to < 0.2K. Set-up is done using a USB interface and the TXU10 "Communication-Box" that can also be used for setting-up the head and DIN RAIL transmitters.

The sensor element is welded directly to the end of the thermometer point thus achieving faster response times. This means reduced tips that were needed to improve response times are no longer required.

The compact thermometers are also available with a 35mm long neck. This makes it possible to measure higher temperatures, up to 200°C, without any problems such as the electronics overheating. The immersion length for this thermometer is between 30 and 300mm and can be ordered to suit.

The TMR35 is constructed with the same adapter system as the Easytemp TMR31.A hygienic process adapters (Clamp, Varivent) can be fitted or exchanged. Additionally the TMR35 can be supplied with a weld-in fitting (DN15, DN10) with integrated thermowell. This device has 3-A approval for the food and pharmaceutical industry.

For further details contact Trevor Fletcher of Endress+Hauser on TEL: 011 262 8000 or visit www.za.endress.com ■

Automated mould/core coating at Sheffield Forgemasters

First UK foundry to adopt two-part technology to coat and dry moulds and cores efficiently.

Sheffield Forgemasters International Ltd. reported it is the first foundry in the U.K. to adopt a state-of-the-art mould and core coating technology, improving the quality its large, high-integrity castings and establishing more efficient production processes. SFIL is a multi-faceted engineering group with specialties in several critical energy markets, including nuclear power plants and offshore drilling platforms.

The SFIL manufacturing complex at Sheffield, England, includes electric furnace melting and casting for ingots, foundry and forging operations, as well as large-dimension machining capabilities.

The 10,000-metric tons/year foundry pours ladles of carbon or stainless steel up to 100 metric tons, for products with maximum dimensions of 16 x 7.6 x 4.6 metres. It is able to produce castings weighing up to 350 metric tons, and engineering, patternmaking, ultrasonic testing, and heat-treatment of finished products are done on site.

Forgemasters' new mould and core coating process is a two-part system consisting of two computer-controlled coating preparation plants, developed by Foseco Ltd., that deliver slurry coatings with consistent viscosity and density; and a dedicated core and mould drying oven, supplied by Omega Foundry Machinery Ltd., to control the drying of the coating.

The new process allows Forgemasters to apply coatings of uniform composition and thickness to its moulds, used to form large, complex steel castings, which reduces preparation time, improves casting surface finish, and makes it easier to remove the refractory from the casting.

The coating acts as a sealant and barrier between the mould and the molten steel, and by using it SFIL reduces the amount of work needed to clean sand and resin from the casting once it is removed from the mould.

Even coating, reduced waste

"It essentially enables us to create an even coating of the moulds and cores, and because the control system is automated, it eliminates manual preparation of the coating slurry," explained Simon Alexander, foundry director at Sheffield Forgemasters. "As the new process works on a closed system, we have also dramatically reduced the amount of waste slurry."

"We use water-based zircon slurry," he continued, "which used to be applied following dilution and quality-control testing by hand, which inevitably leads to inconsistent coating quality and thickness."

"Seasonal temperature variations in the foundry also complicate the traditional, manual approach," Alexander noted.

The temperature-controlled slurry is automatically diluted and tested, and then pumped to an application nozzle for the operator to direct over the sand mould. The uniform composition and density ensures that the cores and moulds are "flow coated," which achieves a constant and accurate layer thickness.

"Any excess coating is collected and recycled," according to Alexander.

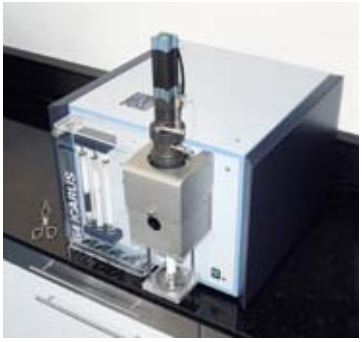
SFIL is conducting trials now to develop a spray application, for use on large moulds or core sections that cannot be directly flow-coated.

After the coating is done, the new system's mobile oven reduces drying time for coatings from several days to just four hours, from start to finish. The rail-mounted oven is able to service four separate areas, each one measuring 4 m², where items are placed, ready for drying.

SFIL indicated the automated coating and drying system represented a "six-figure cost" that is part of a continuing capital improvement program at the Sheffield Works. The program reached £50 million ($76.3 million) recently, and the company is diverting all profits into plant improvements, "in order to capitalise on technology and skill to break new markets," according to a statement.

"Part of Forgemasters' ongoing strategy is to refine systems and invest in technology where it can demonstrate a measurable improvement to what we do, and the new coatings system is a prime example of that approach," Simon Alexander explained. "We are champions of technology, which helps to make our products the best that they can be, and we are pleased to be the first adopters of the system in the UK." ■

Bruker G4 Icarus Carbon / sulphur analyser



For rapid and precise carbon and sulphur measurements the G4 ICARUS HF, using the combustion method with high frequency induction furnace and infrared detection, proves highly effective especially with metallic materials and also with inorganic materials like cement, clays and many others. The solid sample, placed in a ceramic crucible together with accelerator material, is combusted in the high-frequency furnace in an oxygen stream.

The carbon and sulphur components in the sample are oxidized to release CO2 and SO2 respectively. These measuring components are swept by the carrier gas O2 to the solid-state NDIR detector system of maximum selectivity and stability.

The analyser is equipped with two measuring ranges for both, CO2 and SO2 with automatic base line compensation (Automatic Level Control - ALC) and automatic optimum range selection.

The calibration of the analyser is made by means of certified reference material. The innovative design of the combustion area with the gas outlet positioned directly on top of the ceramic crucible for assisted removal of the formed metal oxide particles, leads to drastically reduced contamination of the quartz combustion tube by dust and slag. The integrated system pressure control and electronic flow regulation enable a fully automatic leak test, which can be invoked via the software.

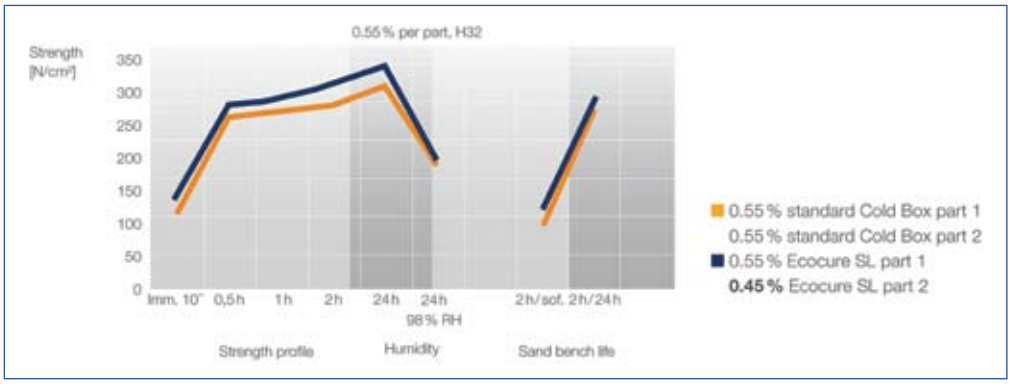
The analyser is characterized by an easy operation and automatic evaluation by means of an external PC. During the analysis, all detector signals are displayed in real-time on the graphic screen. The analysis results together with the analogue detector signals and the complete set of parameters are displayed on the screen and stored. The complete data records can be transferred to an external computer system.

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

Solventless cold-box technology
reduces emissions and offers added value in the foundry process

Less solvents, greater added value.

Foundries are constantly seeking not only to reduce emissions in the foundry process but also to optimise their added value. An important point of leverage here is the cold box binder system. Thanks to the new solventless cold box technology from ASK Chemicals, foundries can now not only dramatically reduce emissions but also improve performance.



A standard cold box system can be described as a three-part system: Cold box part 1 comprises around 55% phenolic resin and 45% solvents; part 2 mainly comprises polyisocyanate derivatives and 15% to 30% solvents; part 3 comprises the tertiary amine catalyst, which initiates the reaction.

The new solventless cold box technology, however, does away completely with solvents in part 2 of the cold box formulation. The solventless part-2 formulation, which has been registered for patenting, contains a special polyisocyanate component. In addition, selected additives have been developed that interact with the adapted part 1.

This means that in comparison with a standard system with 100 parts of part 1 and 100 parts of part 2 in sand, the SL system enables the use of the same 100 parts of part 1 but reduces the content in part 2 to just 80 parts. The binder mixture therefore contains the same weight of active material (phenolic resin and polyisocyanate) and additives but with the weight of solvent reduced by around one-third.

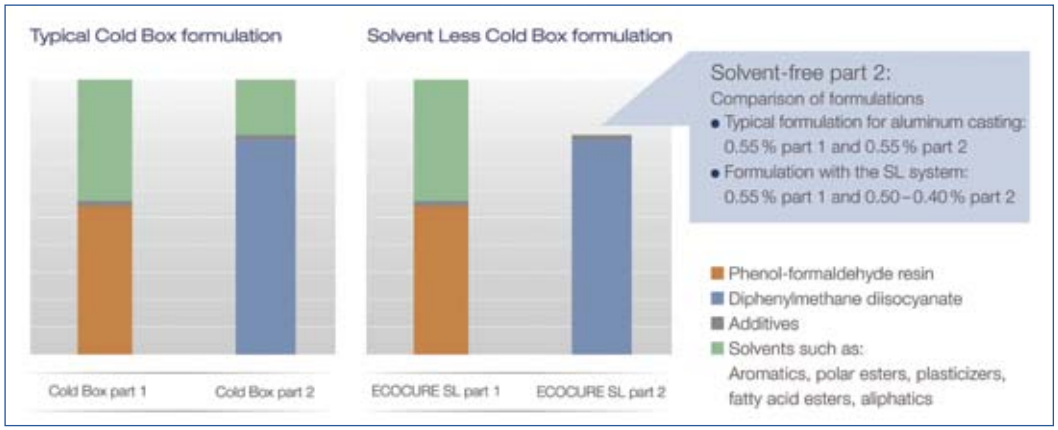
Impressive performance

This enormous reduction in the weight of solvent in the SL system offers numerous benefits. Above all, having fewer solvents helps to reduce emissions throughout the entire process. In contrast to any of the systems developed so far, solventless technology also helps to reduce unwanted emissions of, for example, BTX.

The introduction of this new technology in various aluminium foundries has also shown that it exhibits outstanding shake-out performance. It is now altogether possible that with less organic material and the same amount of oxygen during casting, more energy can be expended in the bond to break up the binder bridges. This additional benefit, along with excellent dimensional accuracy, was confirmed in a series of foundry trials – a clear sign that the thermal stability of the solventless technology has been perfectly optimised to combine both properties.

Further tests have also shown that less amine is needed. Amine is used in the cold-box process as a catalyst to initiate the reaction between the OH and NCO groups. Theoretically, very little amine is needed for triggering a complete polymerisation. In practice, however, amine requirements can fluctuate considerably depending on the differences in the formulation of the binder. This is because amines exhibit different levels of solubility in the different solvents. The weaker the affinity of the amine with the solvent, the greater the efficiency, which explains why reducing the solvent in a binder system also means less amine is needed. Ultimately, the moisture resistance of the cores has been optimised without affecting the bench life of the sand.

With all the benefits it offers, solventless cold box technology is the perfect solution for meeting the current and future requirements of foundries and especially in regard to the ever-increasing demand for new casting mold designs and the ever more stringent customer demands.



Thanks to its eco-friendly and high-performance Ecocure SL technology, ASK Chemicals is making yet another decisive contribution to meeting the future environmental and economic requirements of the foundry industry.

For further details contact Applied Solutions on TEL: 011 922 1600 ■

RKC Instrument announces high performance process controller in a short case

RKC Instrument has announced the release of the FB series high performance temperature/process controller with an accuracy of 0.1%. The operator can select from auto-tuning, advanced auto-tuning, or a more advanced Brilliant II auto-tuning feature which allows selectable PID control. A special start-up tuning feature calculates optimum PID values and eliminates time that conventional auto-tuning requires at start-up. Sampling time can also be selected as 50ms, 100ms or 250ms, depending on the application.

The series has universal input, up to seven digital inputs, four digital outputs and two communications ports so that one port can be dedicated to inter-controller communication. A remote setpoint input and a multi-memory area is standard. As many as eight sets of parameters can be stored in the multi-memory area and may be set easily through front key operation, DI, or communications. The multi-memory area may be used to create up to 16 segments of ramp/soak control.

The series is available as a 1/4 DIN or 1/8 DIN x 60mm deep panel saving short case, which has NEMA4X and IP66 waterproof and dustproof protection. The five digit display is a large, easy to read 20mm height. The front panel also features a settable bar graph display. The internal assembly is removable from the front to allow for easy maintenance.

A loader port comes standard to permit communication with a PC using its USB port. Win-UCI software is provided to make data monitoring/logging easy in setting control parameters or copying parameters to another FB series controller via PC. Communication capabilities include RS-232C, RS-422A, RS-485 and Modbus.

Options include up to four event alarms, heater break alarm, analog retransmission output, power feed forward function, and feedback resistance (FBR). An inter-controller option uses digital communication to achieve precise cascade control, a group RUN/STOP function, temperature ratio setting, and uniform temperature-rise even when using as many as 32 controllers.

The FB series is an ideal instrument for both end-users and the OEM market in a wide range of industries including ovens, furnaces, kilns, annealing and other heat related processes, test stands, environmental chambers, plastics, and packaging.

For further information please contact the Sales Department, Temperature Controls, on TEL: 011 791 6000 or email: sales@tempcon.co.za or visit: www.tempcon.co.za ■

StrikoWestofen new pilot plant centre in Wiehl offers individual training opportunities

Well-trained personnel can make the daily operation of melting and dosing systems considerably more efficient and economical. This is why the StrikoWestofen Group runs a comprehensively equipped Pilot Plant Centre at its Wiehl location. Here the manufacturer of thermal process engineering for light metal casting offers its customers extensive theoretical and practical training courses. They focus on system availability and energy-efficient, resource-saving operation – aspects which are a significant competitive factor in daily foundry operation.

Production downtimes and standstills are great cost drivers in everyday foundry operation. For this reason, StrikoWestofen is improving its melting and dosing furnaces, not only with regard to energy- and material-efficiency but also with a view to shortened set-up times and an extended service life. Qualified personnel are vital in order to ensure reliable operation, to speedily detect and eliminate sources of error. Therefore, the StrikoWestofen Group has been offering an extensive customer training program for years now. “When our company moved to new premises, it was a logical step for us to create capacities for improved training measures as well. The result is our new Pilot Plant Centre, which offers us excellent training conditions for practical courses too,” explains Holger Stephan, head of “Service and Spare Parts” at StrikoWestofen. In two- to three-day seminars, the operators learn all the important details for the energy-efficient operation of melting and dosing systems.

Efficiency of a melting system depends on operator as well

StrikoMelter melting furnaces from StrikoWestofen now achieve energy consumptions of only 53 m3 of natural gas per ton of molten aluminium and a material yield of up to 99.7 percent. This efficiency depends on a wide range of factors such as the quality of the furnace lining. The operator has an important role to play in ensuring the highest possible efficiency throughout the entire operating time of the system: if he has the necessary qualifications, he can detect and prevent possible weak points at an early state. For this reason, StrikoWestofen offers a total of two training blocks for operators of StrikoMelter melting furnaces. Besides the basic course, the in-depth course “Energy Efficiency” in particular

At the Pilot Plant Centre, teaching units can be carried out using all StrikoWestofen control systems – from Westronics and DPC control to ProDos XP control

Fully functional: the Westomat dosing furnace at the Wiehl Pilot Plant Centre allows extensive practical customer training courses to be held under real-life foundry conditions

helps to find possible weak points in everyday foundry operation and minimise energy losses. In a multilevel process consisting of training, evaluation of the actual situation and targeted modification of the system, StrikoWestofen achieves considerable improvements in terms of energy and material efficiency for the customer. These improvements ultimately prove to be an immediate competitive advantage due to the reduced piece costs for castings.

Westomat training: more than just dry theory

The Pilot Plant Centre in Wiehl has a fully functional Westomat dosing furnace which allows a wide range of scenarios to be simulated. For example, StrikoWestofen can simulate complete production cycles and thus provide a realistic training program. “The dosing furnace here at the Pilot Plant Centre can be operated with all of our currently available control systems. This allows us to take the individual needs of the participants into account and achieve the highest possible customer benefit. In contrast to training courses held on the customer premises, here we also have the opportunity to integrate deliberate faults into the dosing process and subsequently train trouble-shooting and fault elimination,” says Holger Stephan, explaining the advantages of training in Wiehl. This is because each minute of standstill in everyday system operation means enormous costs for the producer. If incorrect settings are not detected, reject batches which have to be booked as losses are the result. Besides the theoretical and practical seminars on Westomat aluminium dosing furnaces, StrikoWestofen also offers a training course on magnesium systems in Wiehl.

More details on the training program and on vacant dates at the Wiehl Technical Centre are available to interested persons directly via the StrikoWestofen Group website www.strikowestofen.com or contact Ceramic & Alloy Specialists on TEL: 011 894 3039 ■

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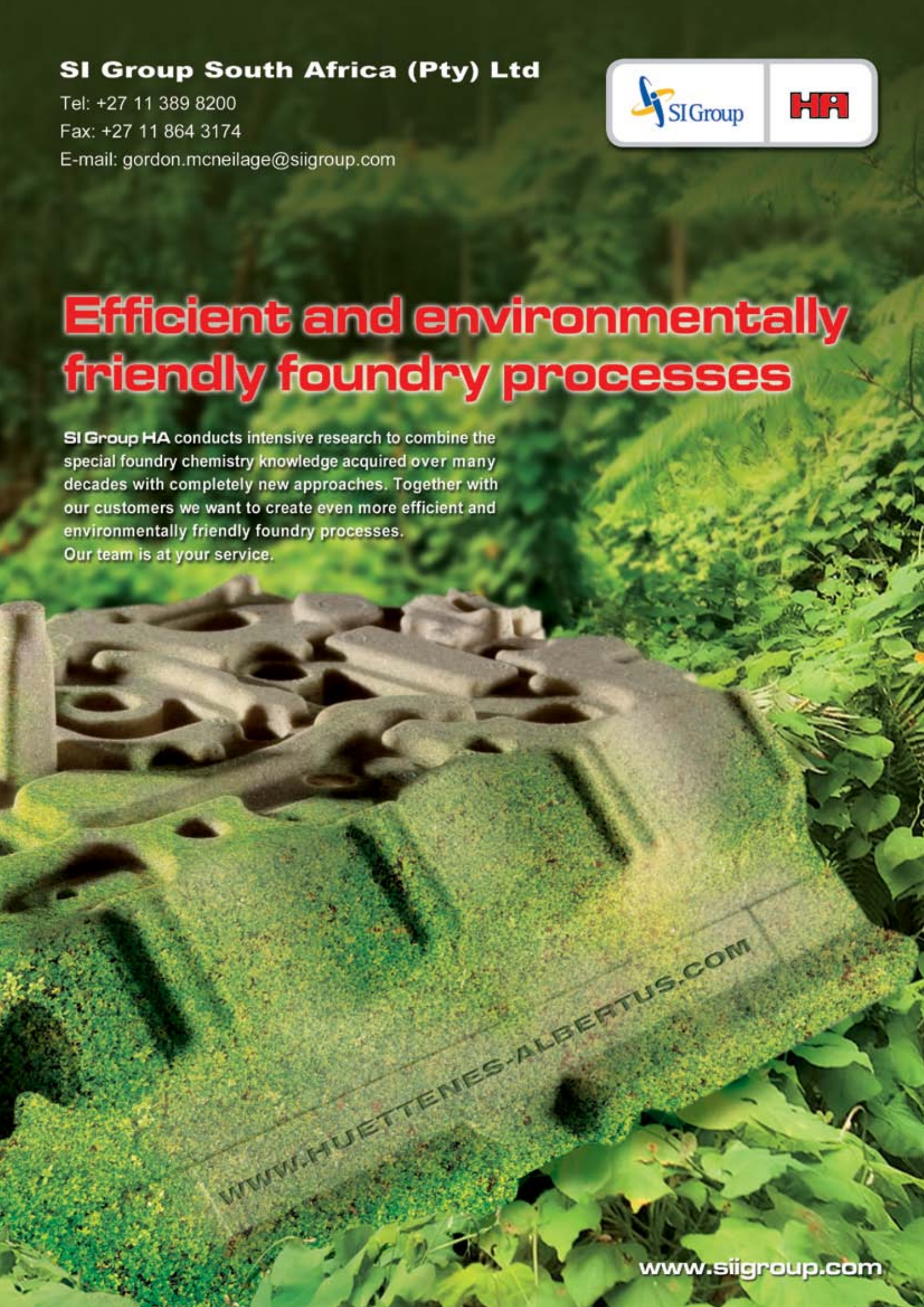

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