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Bruce Crawford

Editorial Board
Marc Hindle

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Wendy Crawford

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Bruce Crawford/Wendy Crawford
Tel: +27 11 463 0489
Cell: + 27 83 628 7654
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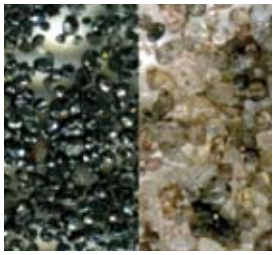

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Address Details

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

Postal Address:
P.O. Box 14863, Wadeville, 1422.

John Davies - Tel: +27 (11) 559 6468;
Cell: 083 630 2809; email: jdavies@uj.ac.za

Executive Secretary - Tel: +27 (11) 559 6455;
Fax: +27 (11) 559 6526; Fax to email: 086 509 7045;
email: saif@icon.co.za / mbiljon@uj.ac.za

Website: www.foundries.org.za

Contact details for Western Cape:
Mike Killian - Cell: 082 442 3785

EDITOR'S COMMENT

Don't overlook the positive news

With the season of labour strikes rampant at the moment it is difficult for many businesses and individuals to be positive about the manufacturing sector. There are so many knock-on effects that come into play if one sector downs tools.

Take for example the some 30 000 auto workers that went out on strike demanding at least a 14% pay increase when inflation is only at about 6%. Employers have offered 8%, which in my book is a fair offer, but this could be open to conjecture depending on your viewpoint. At the time of going to press the three week strike had not been resolved at most of the seven car manufacturing companies across the country.

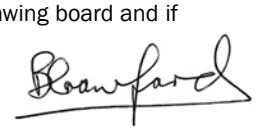
However, the cost of the strike for just the manufacturers has been reported to be in the region of R20 billion already. This is not taking into account the long term cost to the auto industry internationally. But it is all those companies and individuals that feed off the auto industry, whether they are component suppliers (foundries included), transport companies or marketers and those that service these companies, that really suffer. Then there are the workers themselves who will take years to make up the money they have lost while on 'holiday'. I sometimes wonder if the Union bosses really think of all the consequences of their actions?

In between there is positive news coming out of the industry and this issue is a great example of lifting our spirits. Government has published a notice whereby the local industry is to benefit from preferential pricing of 20% on ferrous and non-ferrous waste and scrap metal. There are arguments for and against the ruling and the ruling has been challenged. I don't take sides but I will equate it to the rhino debacle we have. Enforce stronger and longer jail terms, take away the high price for the rhino horn and the incentive for the poachers will diminish. Likewise reduce the price of scrap metal for the informal collectors, enforce the paperwork and suddenly we won't have so much theft.

Then I have the story whereby the SAIF has been instrumental in setting up the Gauteng Foundry Training Centre. This could be a gem for the foundry industry and the forerunner for more of these centres around the country. I implore the industry in the Gauteng environs to participate and not let it falter like the Western Cape training centre.

Other stories include Lusafrica Founders investing in the company, a new graphite milling and bead plant for Fochem, the titanium pilot plant that has been established, and there is the possibility of a new steel plant in which the government wants to see an increase in competition in the steel industry and ultimately lower input costs for a host of industries.

There are a number of other positives happening in industry that are still on the drawing board and if they come to fruition they will certainly be worth reporting about.



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Environmentally respectful binding systems

In the last few years, the increasing complexity in design and manufacture of cast parts has inevitably led to constant improvement in the technological properties of the core binders used in such production. For example, it has not only been necessary to enhance the strength parameters and improve sand flow, but also to adapt the chemical curing process to shortened fabrication times. This process of technological property enhancement has been and remains coupled to the necessity of improving the environmental behaviour of the binders. This justified and necessary concern for the emissions liberated during coremaking and after casting has led to a change in thinking about continued development of modern organic coremaking processes, as in the no-bake, resole and CO2, cold-box, hot-box and shell moulding processes, with the result that the desired technical development targets have been exceeded in some cases.

Furane is the preferred moulding medium for wind turbines

Low-sulfur Kaltharz binder systems

Furfuryl alcohol-based Kaltharz (cold curing) binders have been used in foundries for production of manually shaped casting molds and cores since the beginning of the sixties. The resins and their activators (hardeners, curing agents) have been continuously improved over the years. If the focus was initially on enhancement of the technological properties, the environmental and workplace aspects have meanwhile become the driving forces for development work in foundry chemistry.

Under the project heading “low-sulfur Kaltharz binder systems”, the goal was set to drastically reduce sulfur dioxide (SO2) emissions in furan resin processing foundries.

The resins most commonly used at present are condensation products of furfuryl alcohol, urea and formaldehyde. They are generally cured by exposure to organic sulfonic acids. The sulphur responsible for the sulphur dioxide emissions is exclusively derived from the acid or “activator”.

Development of special low-sulphur activators for use with modified Kaltharz furan resins has been successful in significantly reducing sulphur dioxide emissions. An attractive side effect is the reduction of the sulphur level in the moulding sand, a benefit that is particularly significant for manufacturers of high-quality ductile iron castings.

Resins and activators

New, furfuryl alcohol-based Kaltharz resins matched to low-sulphur activators have been developed. They feature increased reactivity compared to that of conventional furan resins.

Processing and addition levels

The processing and addition levels do not differ from those used in conventional furan resin-activator systems. Existing mixers can continue to be used.

Moulding matrices

In principle, all moulding matrices customarily used for the Kaltharz process may be employed. These are mainly various grades of silica and chromite sand.

Changes in the sulphur level recycled (“old”) sand

The sulphur level in the sand of the foundry switched to the new system has been continuously monitored since November 2002. The initial levels were very high and undesirable, but were thus ideally suited as a starting point for a long-term comparison.

Development of sulphur dioxide (SO2) emissions

The following two measurements were performed under comparable conditions, as confirmed by the similar total organic carbon concentrations determined by analysis of other components.

Sulphurization in the peripheral zone of the casting

The level of sulphurization in the peripheral zone of the casting was determined in another foundry. The casting moulds were fabricated using a standard system and the low-sulphur system, in both cases with recycled sand. Despite the latter circumstance, the determined sulphur levels in the peripheral zone of the casting were lower with the low-sulphur system than when the old binder system was used.

As expected, the results of the sulphur determinations uniformly show a marked gradient in the level of sulphurization from the surface to the center of the casting.

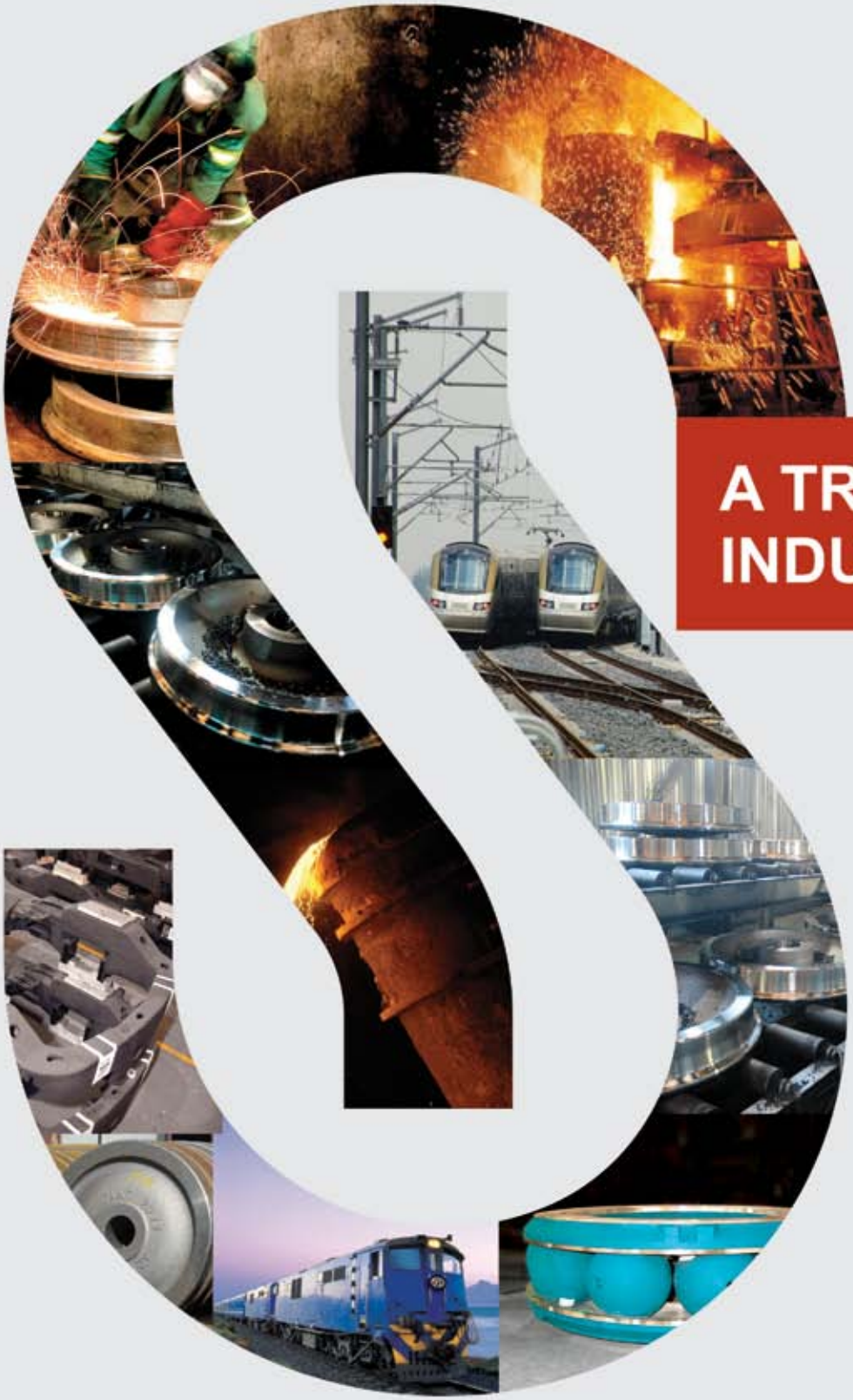
Bending strength levels

The bending strength levels were also determined for this foundry. They did not differ from the bending strengths customarily encountered there.

Summary

The total sulphur levels in Kaltharz furan resin systems could be reduced by nearly half. This result could be impressively verified by all trials and measurements carried out to date. Thus, a new, improved Kaltharz binder system that markedly reduces sulphur dioxide emissions and therefore contributes to better conditions at the workplace and in the foundry environment is available to the foundry industry. Sulphurization is decreased in the peripheral zone of ductile iron castings.

For further details contact the SI Group South Africa on TEL: 011 389 8220 or visit www.siigroup.com or www.huettenes-albertus.com ■



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Local industry to benefit from **preferential pricing** of 20% -
The new procedure commenced 16 September.

Government publishes notice

for the procedure to be followed in future for the exportation of ferrous and non-ferrous waste and scrap metal

In a general notice published in the Government Gazette of 02 August 2013 (No. 36708) the Minister of Economic Development issued a trade policy directive in terms of Section 5 of the International Trade Administration Act, 71 of 2002 (the Act) that the International Trade Administration Commission of South Africa (ITAC) exercise its powers under the Act to regulate the exportation of ferrous and non-ferrous waste and scrap by not allowing the exportation of ferrous and non-ferrous waste and scrap (hereinafter collectively referred to as scrap metal) unless it has first been offered, for local beneficiation, to domestic consumers of scrap metal, i.e. foundries, mills, mini-mills or secondary scrap processors, for a period determined by ITAC and at a price discount or other formula determined by ITAC.

Furthermore, in connection with the above, ITAC must ensure that the type and quality of scrap metal intended for export is accurately reflected on applications for export permits and that all permit applications are accompanied by a letter or certificate by a metallurgical engineer or an otherwise suitably qualified person, confirming the type, quality and quantity of scrap available for export, as well as information as to when and where such scrap metal may be inspected by prospective buyers (who are the domestic consumers referred to in the above).

In accordance with the International Trade Administration Commission of South Africa's Report on the Price Preference System for Ferrous and Non- Ferrous Waste and Scrap:

Domestic consumers of scrap metal, i.e. foundries, mills, mini-mills or secondary scrap processors will enjoy a preferential pricing of 20% from 16 September 2013. The policy is in line with the Government's Industrial Policy Action Plan (IPAP) and National Development Plan to support the growth of key industries, to help create jobs and alleviate poverty and inequality. More importantly upstream beneficiation of castings, sheet and plate will make local industry more competitive

Scrap metal is used extensively in the production of castings and is one of the highest input costs for foundries. However one must remember that this preferential pricing of 20% is only on scrap metal and not on all the other input costs that are incurred to make a casting. So casting users cannot expect to get a 20% discount on their purchases in future

Report No.441, scrap metal will be allowed to be exported only if the scrap metal concerned was offered to domestic consumers at a price that is 20% below international spot prices for the published types and grades of scrap metal.

The price preference at which the scrap metal must be sold to the local consuming industry will be calculated as follows:

- Price preference calculations will be done by ITAC for scrap metal with regard to all the different types and grades using the Spot Market Reports available from Scrap Index.com. From the average price achieved during the previous month for the different types and grades of scrap metal as reflected in the Scrap Index.com spot market price, an amount of 20% will be deducted to reflect the price to be paid by the local consuming industry
- Calculations will be done at the end of each month and published monthly, after such calculation, on the ITAC web site as the preferential discount price at which the specific type and grade of scrap metal is to be offered to domestic consumers during the next month.

Example

a) Scrap metal price for mill finish 6063 = $1900/t
b) Deduct 20% from $1900 = $380 = $1520/t
c) Convert $1520/t to R/t = $1520 x 9.20 (average exchange rate for the past month) = R13984/t ▸

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d) R13984/t for mill finish for the next month is the preferential discount price to be offered to domestic consumers.

A technical Working Group consisting of one representative of the Metal Recyclers Association, the South African Iron and Steel Institute, the South African Institute of Foundrymen, the Aluminium Federation of SA, Copalcor, the Recyclers Association of SA, any other applicable industry representative organization, and ITAC, may meet as and when required to discuss issues specific to the administration of the price preference system.

Applications for export permits must be submitted to ITAC twice weekly, enabling ITAC to compile the information into a circular for circulation twice weekly (on Wednesdays and Fridays) to the industry representative organisations referred to in 5 above who in turn will forward the information to their respective members (other industry representative organisations with a direct interest in scrap metal exports may request ITAC to be included in the circular).

Applications referred to above must reach ITAC by 12h00 on the Tuesday prior to the Wednesday circulation and by 12h00 on the Thursday prior to the Friday circulation. Applications received after the cut-off date and time will stand over until the next circulation.

Before the end of a circulation period of 15 working days, a buyer of the scrap metal must submit a signed copy of the agreement reached between it and the export permit applicant, to ITAC. The agreement must, inter alia, specify the volume to be purchased. (As an example, if an application is circulated on Friday, 1 November 2013, an agreement must reach ITAC on or before Friday, 22 November 2013.)

The agreement signed between the buyer and seller (permit applicant) must reflect the circulation number as well as all relevant information enabling ITAC to link the signed agreement to the originally circulated application.

The volume in the original application will be reduced by ITAC in line with the volume (kg) purchased by a domestic consumer. The export permit will be issued within 3 working days after the end of the applicable circulation period. If the entire volume for which an export permit was applied was sold to a domestic consumer, the permit application will be filed for record purposes.

As indicated above, only foundries, mills, mini-mills and secondary scrap processors will be allowed to buy the scrap metal reflected in the circulars and the scrap metal bought will be for local consumption only.

If, at the end of a circulation period, no agreement for the purchase of scrap metal is received by ITAC, export permit/s applied for will be issued within 3 working days after the applicable circulation period has lapsed.

Where an agreement is reached to purchase a portion of the scrap metal for which an export permit was applied for and this agreement is reached before the end of the circulation period, an export permit for the remaining balance as applied for, will be issued within 3 days after the end of the circulation period.

In the event of more than one domestic consumer being interested in purchasing the scrap metal for which an export permit was applied for, it will be up the parties to reach an agreement with regard to which domestic consumer will purchase the scrap metal or whether both parties buy a portion thereof. The outcome of the agreement reached between the parties must be submitted to ITAC in the form of a signed agreement (as referred to above)

Agreements to purchase scrap metal must be reached prior to the end of the circulation period. All new entrant ▶

New export guidelines for the exportation of scrap metal welcomed by the Non-Ferrous Metal Industries Association and The Zimco Group

The Non-Ferrous Metal Industries Association (NFMIA) and The Zimco Group fully supports the policy directive issued by Minister Ebrahim Patel and the new guidelines for scrap metal exports issued on 02 August by the International Trade Administration Commission, ITAC.

The NFMIA membership comprises several of SA's major scrap metal value adding industries including Copalcor, Fry's Metals, Maksal, NFM, Zimalco and Zinchem. These industries are responsible for adding value to many types of South Africa's scrap metals including copper, brass, lead, aluminium and zinc.

"The government's new infrastructure build programme will require the full support from all industry sectors including scrap collectors, scrap processors, secondary metal smelters, mini-mills, foundries, extruders and die-casters. Since the year 2000 these industries have suffered due to the lessening availability of affordable and quality scrap metal as exports of these metals soared mostly to Asia. This resulted in up to 10,000 job losses in the total foundry industry alone with the aluminium sector suffering the worst, shedding up to 64% of production capacity over the last six years," said Bob Stone, Chairman of the NFMIA and Sales and Marketing director at The Zimco Group.

"As demand for scrap metal increased, mainly out of Asia, the price increased phenomenally to the extent that the cost of scrap metal to the local processing industries in some cases amounts to more than 70% of their total running costs. South Africa has lost many of its value adding industries especially in the automotive component, pump, construction, machinery and furniture sectors, lowering exports and increasing imports."

The new guidelines which will give local industry buyers of scrap metal a preferential price of 20% below the international price will level the playing field between South Africa and its international competitors. This will give local industry the ability to grow back to its original strength and put it in a strong position to meet the upcoming demands of the National Development Plan infrastructure build, localisation drive and the need for job creation.

"With the funding of the National Foundry Technology Network and their efforts in revitalising the foundry industry through training and technology transfer a sound base has been established. With the further assistance of the new scrap export guidelines and local price preference we look forward to a sustainable and competitive non-ferrous metal industry delivering job creation and socio economic upliftment," continued Stone.

"We applaud the Department of Trade and Industry for their comprehensive and positive inputs over the last 10 years and the Economic Development Department and ITAC for the new framework on which to rebuild not only the industry but also the country."

The Zimco Group of companies comprises several of SA's major metal value adding industries including Fry's Metals, Castle Lead Works, Associated Additives, Zimalco and Zinchem who are responsible for adding value to many types of SA's metals including lead, aluminium and zinc. Other divisions within the Group supply products into the foundry, mining, steelmaking, automotive, agricultural and many more industrial sectors critical to the South African economy.

For further details contact Bob Stone on TEL: 011 914 4300 or 083 325 9557 or email bobs@zimalco.co.za

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The MRA comments

The Metal Recycling Association (MRA) believes in free trade and prices being set by market forces and not by Government departments. It is therefore totally opposed to the "price preference system" which Government wishes to introduce.

The system appears to have originated by the foundries falsely claiming to Government that there is a shortage of suitable scrap metal for their operations because the scrap recyclers are exporting it. The correct situation is that there is a surplus of scrap metal available but foundries have to pay export-equivalent prices (prices offered by foreign buyers less the cost of transport and freight to those foreign buyers) in order to compete for scrap metal supply.

Foundries claim that they cannot "afford" to pay competitive prices but no proof has ever been published in this regard. If foundries have not invested in capital improvements and efficiencies over the years, they should not be given assistance at the expense of factories generating metal offcuts from manufacturing, the mining and construction sectors, and thousands of street collectors of scrap metal trying to eke out a living.

If Government believes that foundries should be assisted, they should arrive at a suitable assistance plan for each foundry, monitor the implantation of such plan and finance it from the general fiscus. They should not force other sectors of society to subsidise the foundry industry with no provision preventing the foundries from pocketing the extra money and making no improvements in efficiency.

applicants will be subject to an ITAC verification inspection before the application for an export permit is circulated to the various industry representative organisations.

Form IE363 "Application for an export permit to export scrap metal" must be duly completed. The application form must contain the full description and customs tariff heading of the scrap metal to be exported including the Institute of Scrap Recycling Industries (ISRI) number applicable to the scrap metal to be exported.

The volume of scrap metal to be exported must be in the possession of the applicant and the address of the premises where the scrap may be inspected by ITAC or the prospective buyer must be provided. A letter/certificate issued by a metallurgical engineer or an otherwise suitably qualified person in the employ of the applicant or an accredited body or party must accompany the application form, confirming the type and grade of scrap metal referred to in the application.

New entrant applicants must complete both forms IE230 (registration as an exporter) and form IE363 (application for an export permit to export scrap metal). Proof of registration in terms of the Second-Hand Goods Act must also accompany all new entrant applications or any application where such registration has expired.

The price preference system for the exportation of scrap metal entered into operation on 16 September 2013.

All export permits issued for the exportation of scrap metal from the date of publication of this Notice until the price preference system enters into force will be valid for a period of 1 month. Volumes reflected in export permit applications received from the date of publication of this notice until the price preference system enters into force will be closely monitored.

ITAC will exempt affected exports from these requirements to the extent that application of these requirements would be in conflict with South Africa's obligations under an existing trade agreement. The guidelines will be applied and implemented in such a manner that they are consistent with any binding trade agreement.

Eds Comment:

The above notice has been challenged by the Metal Recyclers Association (MRA) whereby the MRA has made an application to the North Gauteng High Court in Pretoria for the Minister of Economic Development and The International Trade Administration Commission (ITAC) to review and set aside the above notice, as well as interdicting ITAC from implementing the above export control guidelines, contending that the guidelines are unlawful.

The first court appearance took place on the 6th September 2013 where the matter was postponed until the 10th October 2013, which is too late for this publication. The outcome of this postponement is that the guidelines/procedures were implemented on the 16th September 2013 until otherwise interdicted.

There have been numerous comments from both sides and it will now be up to the court to decide the future of this notice. Below are some of these comments giving the respective parties point of view. ■

One reader sent in this comment

"I have read the action as proposed by the metal recyclers with interest. In reality their action is one of making a point for the sake of objection in my opinion."

"We have already seen that the lower prices offered to us for material we will not be able to use have now taken the "discount" into account. In fact one of my colleagues in the recycle industry said that the controls meant that he would have to lay out significantly less cash in future and that in essence they would still earn their margin. In his opinion the current buyers of scrap would continue to buy the scrap and the volume exported would initially marginally decrease as some material would be consumed as a result of new entry buyers. In fact the margins would increase in the case of the product that would be exported. The recycle market will reach an equilibrium in a very short time."

"What is significant is that the small operators and scrap scavengers will earn less for their efforts, and this will aggravate their situation. The other side of the coin is that the reward for the thieves will be lower therefore as a side effect see less material such as copper being stolen and finding its way into the market."

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New graphite milling & bead plant for **Fochem International**

The new thermo-oil system

"Graphite has been increasingly difficult to procure as a result of a world shortage. Prices have been rising and with a lower purity and accordingly a lower quality offered. This has led us to design and commission a new graphite milling plant at our facility in Alrode, Gauteng," said owner and founder Axel Bastian.

"Graphite is a key raw material for Fochem International's products. Therefore we had to take steps to ensure that we are in control of this key area of our manufacturing process. We are now able to process raw pieces of graphite into nano particle sizes. This will make our company independent from the worldwide resource market for fine graphite powders," continued Bastian.

"Fine graphite powders are used as a base for products such as lubricating oils and greases, dry lubricant films, packing and seals, rubber and plastics, extrusion lubricants, release agents, drawing compounds, forging, wire drawing, TV tubes, brake linings, clutch facings, batteries, conductive coatings, colour pigments and powder metallurgy," said Bastian.

"Our comprehensive portfolio ranges from release agents, lubricants and coatings to customised products. The industries we service include die-casting, forging, extrusion, mining, aluminium refineries, conductive cable coatings and seamless tube manufacturers," said Bastian.

"Graphite is a key functional material in many of our products, specially in plunger lubricants. It can be supplied in a variety of carriers, in the form of wax beads, oils, greases and water based products. The carrier serves not only as a lubricant itself, but also helps to distribute the additives over the surface of the shot sleeve. Once applied the additives cover the plunger through the capillary action," explained Director Alexander Saam.

High-pressure die-casting

"In high-pressure die-casting the molten metal is injected into the die cavity through a cylindrical sleeve by a plunger that forces the molten metal through a narrow orifice at high speed and pressure. Proper lubrication of the plunger is essential to provide smooth filling of the cavity, reduce energy consumption during the shot and extend the life of the plunger tip and sleeve. Plunger lubricants are used to minimise the wear to the plunger tip, thus increasing its lifetime and reducing the downtime for replacement," continued Saam.

"Porosity is one of the biggest problems in die-casting. The die-casting process is very often used to make lightweight components out of light metals, with the objective to replace steel or iron components. Yet the intrinsic strength of these lighter metals is less than that of steel and iron, therefore anything that can adversely affect the strength of the component is undesirable. The presence of small pores within the cross section of the casting can have a big impact on the tensile strength. Gas porosity is a consequence of the very high velocities at which the metal is injected into the mould. However, it can also be aggravated by the presence of water on the die and the decomposition of any organic compounds within the die and the shot sleeve."

"Another common concern in the shot-end of the die-casting machine is the formation of smoke and flames when molten metal is injected into the shot sleeve. The heat of the melt can cause the organics in the lubricant to catch fire and, as this is a low oxygen environment, the incomplete combustion results in the formation of smoke."

New bead plant

"We started manufacturing wax based beads in 2001. The reason we chose the wax route, as against oil based beads, is that it is more environmentally friendly and the beads can be dosed precisely and consistently in an automated manner. The beads act as a protective against erosion of the sleeve and once the wax has burnt off a solid lubricant remains, thus lubricating the entire plunger."

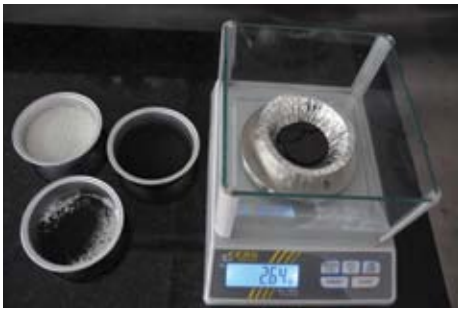
"Solid plunger lubes are applied by an automated device through the pour hole into the shot sleeve. The beads are so constituted that they melt and consequently assist in the distribution of additives over the surface of the tip and shot sleeve. In order to achieve this, it is necessary that the temperature of the plunger is 20°C higher than the congealing point of the wax."

"Our plant in Alrode has now been virtually rebuilt from scratch and production, which is now at 10 tons per day, commenced in May this year. There are a number of reasons we have made this major investment in plant and equipment but one of the main reasons is that we needed to increase our production capacity to meet demand both locally and internationally, as we now export to 17 different countries. Moreover, through an improved and innovative manufacturing process, we have revolutionised the lubricating quality of our beads."

"With the introduction a new 35 metre high processing tower and a new thermo-oil system has ensured a reliable and more efficient manufacturing process. The new thermo -oil system not only melts the wax in the mixing tanks, but also heats the jacketing of the wax transporting pipes so that the wax is kept at a constant temperature.

The new 35 metre high processing tower

New mixing tanks were installed



The company is ISO 9001:2008 certified and takes particular care in the quality department

Screening, sieving and storage are now more efficient and the consistent quality of our products is guaranteed."

"The plant produces six different sizes of beads, that range from dust to 0.2mm to 3.0mm. Beads are offered in both graphite and white pigment colouring. Our graphite beads are a striking success and a valuable asset to our product portfolio. The newest development, 'white beads', offers excellent lubricating properties as well, due to a solid content of 20%."

"However, the presence of dark or discolored areas on the surface of the castings can invariably be traced to the application of plunger lubricants and has nothing to do with the graphite product. Even an over dosage of white beads or clear oils can cause discoloured areas on the biscuit and the casting. In most cases either too much lubricant or the wrong kind of lubricant has been applied. This could be due to a lack of care or variation between operators. Using too much plunger lubricant is usually a sign that the plunger life is being stretched or there is some misalignment."

"We have now developed an automated dispensing unit that, used in conjunction with our beads, will apply the correct amount of lubricant for the specific application. This eliminates any dark or discoloured areas as the amount of beads per shot can be precisely dosed. We can assure you that you will not have to deal with any problems relating to blockages of the dosing tubes, fluctuating dosing amounts and discoloured areas. The entire operation of our "Bead Dispenser 3D" is reliable, precise and the work environment remains clean."

Bagged product ready for shipment

The new screening, sieving and bagging area

Other products – oils and pastes

"We offer a range of other plunger lubricants in the form of oils and pastes, graphite-based as well as graphite-free. These products are applied by means of spray or a drip application. The selection of the most suitable lubricant depends on the manufacturing and application process."

History

Fochem International was founded in South Africa in the early 1970's as one of the first manufacturers of colloidal graphite. In the early 1990's Tribo-Chemie GmbH was founded in Germany for the purpose of being closer to the company's customers in Europe. The company is ISO 9001:2008 certified and exhibits at GIFA and related exhibitions worldwide. They distribute their products through agents based in India, Brazil, USA, Taiwan, Malaysia, Japan and others.

For further details contact Fochem International on TEL: 011 903 9720 or visit www.fochem-international.com ■

Foundry industry's vision of a **training centre** comes to **fruition**

SAIF instrumental in setting up the Gauteng Foundry Training Centre

In an era of corporate reorganisation, mergers, and globalisation, metalcasting is one of several critical industries that require a well-educated workforce in order to remain profitable and competitive. More specifically, all these industries are alike in requiring an immediate commitment to fundamental research — research that is essential to providing innovative solutions and technological developments for the brick, refractory, and insulation materials being used in metalcasting operations. Achieving these goals requires not only a coordinated commitment to education and research programs from the engineering, science, and technology sectors, but also requires an effective networking of these academic and industrial concerns for a qualified work force. Continuing education can achieve these goals.

The foundry industry in South Africa has for years been envious of what a number of its international counterparts are offered by their industry bodies in terms of training and research. The SAIF and its members have explored numerous options but there has always been a financial constraint.

The Lauds 1-3TPH high speed continuous mixer with a Lauds Auto-Blend 3000, which is a temperature sensitive blending dosing system for the mixer

The SAIF is involved in a variety of initiatives to tackle the need for skills development and education in the foundry industry. The advent of government sponsored training courses three years ago, which the SAIF have been tasked to be custodians of and implement, and have had their contract renewed for another three years, led the SAIF to spearhead an initiative to create a hub for practical foundry related skills training and technology transfer in the greater Gauteng region.

The first molten-metal pour on 19 September 2013 at the Ekurhuleni East College (EEC) for FET (Kwa Thema campus) in Springs, Gauteng will hopefully ignite a new era in the foundry industry in South Africa.

The Gauteng Foundry Training Centre (GFTC) is a joint initiative of the Gauteng Department of Economic Development (GDED), the South African Institute Foundrymen (SAIF), the Ekurhuleni East College for FET (EEC) and the NFTN, a government funded enterprise.

The establishment of the GFTC on the Kwa Thema campus of the EEC was a strategic decision, taking into account that more than 50% of the foundries are situated in the area and that the EEC already hosts a similar centre for the tooling industry.

The foundry industry has been through many challenges over the past three decades, with a roller coaster economic ride, stiff international export competition from China, India and other countries, the surging input costs of electricity, transport and scrap metal and other factors. To remain globally competitive, it is therefore vitally important to train and upskill artisans and provide a secure foundation for the future of the industry.

Fast learnership programmes are not ideal but do have a role to play. What is needed to make the foundry industry competitive locally and internationally is proper training for artisans. One cannot rush educational basics and a suitable standard of training also has to be established.

Dignitaries, sponsors and guests from the foundry industry were on hand to witness the opening of the GFTC training centre that will indeed go a long way in tackling the need for

The Lauds 6L hydraulic jobbing cold box core blower complete with the Lauds vertimix batch mixer and pump set which feeds directly into the Lauds skip hoist delivering mixed resin cold box sand to the core blower on a fully automatic basis

Lauds has been responsible for supplying most of the laboratory equipment

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skills development and education in the foundry industry.

The training centre boasts a fully equipped melting, chemically bonded moulding, core making, green sand moulding, sand testing, and laboratory testing for materials and pattern shop facilities. It will offer practical training of students in the foundry industry, over and above theoretical knowledge.

Robert Bezuidenhout, who has been in the foundry industry since he was 16 and now has 47 years experience, was appointed the centre manager nine months ago and he, along with the SAIF CEO John Davies, have been working tirelessly to have the centre operational for the official opening.

The equipment

The GFTC has been set up in an 800 m^2 facility and financial and material (new foundry equipment and materials) support came from many metalcasting companies and industry suppliers, for which the custodians of the GFTC are grateful.

Local foundry equipment manufacturer Lauds Foundry Equipment have supplied a 1-3TPH high speed continuous mixer with a Lauds Auto-Blend 3000, which is a temperature sensitive blending dosing system for the mixer.

Lauds also supplied a multi-loop line that enables the cores and patterns to be moved with ease and returned to the mixer for a continuous moulding operation. In situ there is the Lauds LCT1 compaction table for mould compactability and to ensure optimum surface finish and quality is maintained throughout the moulding process.

Included in the equipment supplied by Lauds is a 6L hydraulic jobbing cold box core blower complete with the Lauds vertimix batch mixer and pump set, which feeds directly into the Lauds skip hoist delivering mixed resin cold box sand to the core blower on a fully automatic basis.

Feeding all of this is the Lauds sand delivery system, which includes a fully automated 5TPH pneumatic conveyor with all the necessary controls for the five ton dry silica sand hopper. The hopper feeds the two Lauds mixers and has a vent unit attached to ensure no dust is present during operations of the filling cycles.

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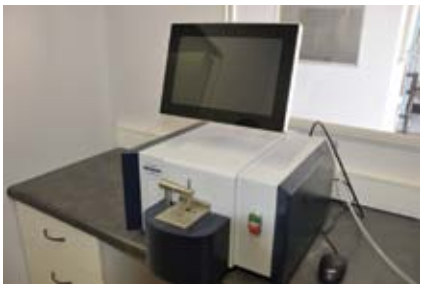

IMP has supplied the Bruker Q2 ION metals analyzer, reported to be one of the smallest and lightest ultra-compact spark emission spectrometers for metals analysis available. The new generation of spark spectrometer Q2 ION primary applications and metal matrices include copper, aluminium and iron for smaller foundries, inspection companies, metal recycling and metal fabricators. Besides the classical analysis workflow, the new Q2 ION now also offers a dedicated workflow for positive material identification (PMI)

The Lauds scrubber ensures all fumes from the cold box production inside the cabinet are neutralised ensuring a green environment for the students to work in.

Lauds has been responsible for supplying most of the laboratory equipment from Simpson Technologies, which includes a sieve shaker, sand rammer, a universal strength testing machine, a permeability machine, sand moisture tester, a shutter index machine and a muffle furnace.

IMP has supplied the Bruker Q2 ION metals analyzer, reported to be one of the smallest and lightest ultra-compact spark emission spectrometers for metals analysis available. The new generation of spark spectrometer Q2 ION primary applications and metal matrices include copper, aluminium and iron for smaller foundries, inspection companies, metal recycling and metal fabricators. Besides the classical analysis workflow, the new Q2 ION now also offers a dedicated workflow for positive material identification (PMI).

In the melting department HPT have supplied the 50 Kg cast iron induction tilt melter. Custom designed and manufactured in South Africa by HPT, it is equipped with the latest IGBT based induction power supply unit, which offers lower energy consumption, it has a small footprint, there is up to a 70% reduction in the cooling system and up to 50% reduction in power components as compared to similar products, says HPT. Maintenance is made simpler by the modular design, and automation comes in the form of intelligent fault diagnostic menus, automated functions like pre-heat/sinter, remote monitoring and diagnostic functions and it is very operator friendly.

The non-ferrous department has been ▸

The two 50 kilogram furnaces installed for non-ferrous melting

The 50 Kg cast iron induction tilt melter custom designed and manufactured in South Africa by HPT

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- HOESCH: grain refiners, master alloy's
- Schaefer: non-ferrous die coats, fluxes
- Striko: aluminium furnaces
- Foundry Automation: core shooting machines
- IMF: turnkey moulding plants and systems
- Mammut: crucibles
- Progelta: molten metal treatment and automation systems for grey and ductile iron foundries
- Kennecott: FeMo
- Elkem: inoculants and nodulisers
- Ceralcast: local ceramic production facility
- CEDIE: cored wire
- RATH: refractory materials

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equipped with a new 50 Kg aluminium furnace and another 50 Kg furnace that was donated and subsequently refurbished before installation.

The latest measuring and testing equipment available that offers greater carbon and temperature measurement accuracy and speed in cast iron production applications, has also been installed. This includes a fixed Digitemp-E temperature measurement instrument, a Carbon-Lab E instrument for fast carbon determination in liquid steel, a handheld portable DigiLance IV instrument with memory and wireless communications for temperature measurement and the MeltControll Software, all supplied by Heraeus Electro-Nite.

The HPT furnace is equipped with the latest IGBT based induction power supply unit, which offers lower energy consumption. It is located next to the latest measuring and testing equipment available

What the GFTC offers

The three trades offered by the GFTC have been developed to fully equip students through an apprenticeship route. These trades are:

- Melter
- Moulder
- Patternmaker

The apprenticeship programmes consist of the three components, which will be presented over a period of 12 months each. In order to qualify the students will have to pass all the modules, which will include knowledge, practical and workplace skills pertaining to each trade.

2014 pilot project for 20 sponsored students

The inauguration of the GFTC has been boosted with the announcement that 20 students will be chosen for a pilot project to complete their apprenticeships at the GFTC. The pilot group of 2014 students selected will have their course fee sponsored by the MerSETA. Students will also receive a stipend during their work experience phase to be conducted at foundries. Students could apply for a grant for their travel and accommodation during the pilot phase.

Applicants wishing to be considered are required to have a NQF level 4 qualification with maths, science and engineering drawing (NCV 4, Grade 12) and the duration of the qualification, which begins in January 2014, is three years.

Other skills programmes that will be offered at the college from next year are based on the existing MerSETA courses already in place.

For further details contact Robert Bezuidenhout on TEL: 082 337 1473 or Jogn Davies on TEL: 011 559 6468. ■

RCF Suppliers expands foundry offerings

Cape Town based foundry consumable supplier RCF Suppliers has revealed that it has formed a strategic alliance with the SI Group HA South Africa, GfE-MIR Alloys and Minerals SA and Ceramic and Alloy Specialists to market and distribute the products of these companies in the Western Cape.

RCF Suppliers has been active in the foundry industry since 2000 marketing and distributing a range of foundry consumables.

"This is a very significant business development for RCF Suppliers as we have built up a reputation of product and application expertise over the last 13 years, and are able to offer custom solutions for metalcasting customers with confidence," said Dean Horne, RCF Suppliers owner.

"I started working in the foundry industry in 1983 at Cape Foundries, which was part of the Murray and Roberts Group at the time. After that I had a period at another of the Group's foundries, Gearings Foundry, before moving to Johannesburg to work at HI Alloy Casting on the East Rand for three years. I then decided to return to the Cape and worked for Castco Precision Castings for a period before crossing the divide into sales."

"My period working at the various foundries gave me invaluable knowledge into the processes and workings of a foundry and this has stood me in good stead for supplying product to the foundries."

"The company has also represented BSD Refractory Supplies for a number of years and with the addition of a broad range of products available from the SI Group HA South Africa, GfE-MIR Alloys and Minerals SA and Ceramic and Alloy Specialists to our portfolio we will be in a position to supply the local industry with most of their requirements."

For further details contact Dean Horne of RCF Suppliers on TEL: 021 551 0582 ■

The latest equipment – an Inductotherm VIP Power-Trak and two 120 kilogram bodies – has increased capacity and productivity in its bronze melting department.

Lusafrica executives constantly look at their operation

to ascertain where they can be more productive

A pit where larger castings are poured

Growth is the "prime directive" for any manufacturer, however saving operating costs in all departments and boosting staff moral will reap the rewards a lot quicker and, once implemented, will be far more sustainable than increased orders. Cost savings are recognised immediately on the bottom line and will often leverage funds for more investment in technology and processes that are at the heart of the company's core.

Executives need to constantly look at their operation to ascertain where they can be more productive and set out a programme of implementation, whether it is in the short, medium or long term. Foundries have many opportunities to adhere to cost saving measures especially if you consider the wastage that takes place in the melting areas.

One such foundry doing just that is Lusafrica. The programme of change in the company started some years ago. Some changes were forced upon the company but most were

Main picture: The most recent acquisition for the foundry's melting department is an Inductotherm 125kW VIP Power-Trak power supply, connected to two push-out furnaces, which was supplied by Cerefco. The 120 kilogram bodies are removable crucible furnaces, which will give the foundry the ability to remove the crucible from the furnace and pour directly into their moulds without having to transfer the metal via ladles. It also provides Lusafrica with the flexibility to use multiple crucibles depending on the type of alloys they want to melt, and by using different crucibles, they are able to avoid any cross contamination. A furnace selector switch also allows them to switch furnaces and provision has been made for a third furnace for future demand

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decided upon because of management's assessment of the company's situation.

"We began by adding 2500 m² of extra floor space to the existing foundry, moulding machines were moved around, and a dust extraction unit was installed as well as a new crane. Effectively we reduced the bottlenecks that were hindering production," said Paul Coelho, one of two sons of the founder, working in the company.

The company purchased a larger baghouse/dust extractor and a wet scrubber, approximately two years ago

"The improvements led us to look at the whole operation of the business. We wanted to add value where we could and also take control of the elements of the business where we were relying on outside influences," Paul continued.

"Once the foundry was operating the way we wanted it to we then looked at the pattern store. We realised it was a mess and we were wasting valuable time locating patterns. First we put in a mezzanine floor to create extra space and catalogued the over 5 000 patterns that we have in store. Each and every pattern is recorded on computer and it now takes less than a minute to locate any particular client's pattern," commented brother and fellow director Pavel.

"Next we looked at the quality of the castings, mainly on the surface finishing side and the time it was taking to cast. Although we had improved our efficiencies greatly by reorganising the foundry we knew there was still a lot of room for improvement," Pavel said.

"So we both decided to visit GIFA and we were amazed at the equipment that was on display. We had done our homework before going and we soon found what we were looking for. The knowledge that we gained by talking to the international companies has also been invaluable," Pavel said.

"We placed the orders for two Omega Spartan 3 PLC controlled sand mixers, each with 20 ton capacity, as soon as we returned from GIFA. One of them is the pivotal type and the other one is an articulating type. Since installation we can see a huge difference in our production times," he continued.

"With our old Omega 22s we were taking 35 minutes to mould and set a one ton casting and now this same operation is taking us only 12 minutes. Because the machines are PLC controlled we have complete control of the process. Sand temperatures are monitored and adjusted automatically and before we start the process we know exactly how much sand, resin and catalyst to use and what the moulding time will be," Pavel continued.

With a constant eye on costs, Paul was pleased to say that costing a casting is far more accurate these days.

In addition Lusafrica also purchased a second five-ton an hour sand reclamation plant and today, although the company consumes 60 ton of new sand a month, 90 percent of the sand is reclaimed.

With the power shortage and shedding problems that beset South Africa the company then had to invest in an one megawatt generator, which keeps the whole company running in times of need.

"We were not happy that we had to make this R1.5 million 'out of the ordinary' capital equipment investment at the time, but in hindsight it has more than paid its way, and as a result we have not let our clients down with late deliveries because of not having energy," Paul explained.

Lusafrica followed up this investment when the company purchased a larger baghouse/dust extractor and a wet scrubber, approximately two years ago.

"This took care of air quality within the foundry and also gave us an opportunity to make money out of the 'waste'. The resultant offshoot of wet scrubbing is sludge that is sold to the brickmaking industry," said Paul.

Staff welfare

The foundry has operated from the same site in Industries East, Germiston, Gauteng since its inception. As a result 'tired' looking buildings that had not had a coat of paint for a number of years have been spruced up, rooftops have been replaced with modern, environmentally friendly materials that allow in more natural light, as well as a general clean up of the factory and office facilities.

"We are currently building an outdoor area that will allow the staff to relax in a more friendly atmosphere, during their breaks. It will include cooking facilities and a grassed area with trees and plants to enhance the space," said Paul.

A casting in the fettling bay

A large casting manufactured by Lusafrica

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A pour taking place

"But the biggest investment has been in the staff changing rooms. We completely revamped this area to a five-star facility that includes natural lighting and a hot water system that uses the natural elements and ensures that there is no shortage."

"All these upgrades have allowed us to not only increase the morale of the staff, which naturally increases their productivity, but also to make savings on electricity costs," continued Paul.

New fettling area and laboratory

The company is currently building a new fettling area that will take it out of the foundry space while also allowing a better flow of castings from the pouring and cooling section to despatch. In addition this area will include the company's shot blasting activities that will be upgraded with new equipment.

"More importantly we have built a new building that will house our laboratory in future. It is not quite complete yet but will give us a huge boost in our testing and quality checking operations. It will house all the usual equipment including a spectrometer, which we have never had before."

The latest investment – an Inductotherm VIP Power-Trak and two 120 kilogram bodies for melting bronze

The most recent acquisition for the foundry's melting department is an Inductotherm 125kW VIP Power-Trak power supply, connected to two push-out furnaces, which was supplied by Cerefco. The 120 kilogram bodies are removable crucible furnaces, which will give the foundry the ability to remove the crucible from the furnace and pour directly into their moulds without having to transfer the metal via ladles. It also provides Lusafrica with the flexibility to use multiple crucibles depending on the type of alloys they want to melt, and by using different crucibles, they are able to avoid any cross contamination. A furnace selector switch also allows them to switch furnaces and provision has been made for a third furnace for future demand.

To save on costs, Pavel, who is the more technically minded of the two brothers, did the installation himself and Cerefco commissioned the installation.

The new furnaces were installed as a cost-saving measure. "We crunched the numbers and realised we were spending more per year to run the old reverb furnace than it cost to purchase and operate new ones," stated Pavel.

"Our old furnace had been in operation since the 1970s and was energised with foundry coke. However the cost of foundry coke, compounded by the difficulty in obtaining foundry coke, pushed us to look at new and also induction," explained Pavel.

"We have since lowered our scrap rate with the new furnaces by exacting precision metal treatments on each melt and maintaining tight sand control," Pavel emphasised.

History

Founded in 1975 by Tulio Coelho the company started trading as Lusafrica Founders in 1978. Eldest son Paul joined the company in 1988 and brother Pavel in 1993.

Lusafrica's speciality is the production of pump castings, namely horizontal split casings, volute casings, impellers, bearing housing, diffusers, delivery covers and suction covers. However, being a jobbing foundry they can supply virtually any type of castings of any shape and complexity.

Recognised as a foundry that supplies many of the major pump manufacturers in South Africa, Lusafrica now regard themselves as a one stop jobbing foundry that takes on castings from one kilogram and up to one ton. They cast in grey iron, SG iron, Meehanite, bronzes and aluminium.

Lusafrica is one of only three foundries in South Africa that operates a Meehanite licence, which has just been renewed until 2016. This Meehanite licence acts as the company's ISO quality management system.

Although Lusafrica are casting all the various ranges of Meehanite, by far the most popular is the HS range, which is a heat resistant range and CB3, which is used in castings where acid resistance is of utmost importance.

Moulding is done by the Furane process, with cores in Furane and CO2 and Lusafrica are tapping about 40 tons of grey iron and 60 tons of SG iron a month. On the bronze side the company casts about five tons a month with a maximum size casting of 30 kilograms. The staff compliment is currently 40.

"We will continue to look at various commercially available services and technologies that will reap the financial rewards for us and our clients. It does not happen overnight but if you are not looking for opportunities you are losing out," concluded Paul.

For further details contact Lusafrica Founders on TEL: 011 873 8910 ■

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Ceramic and Alloy Specialists

signs distribution agreement with GfE-MIR Alloys and Minerals SA

Ceramic and Alloy Specialists has entered into a sales and distribution agreement with GfE-MIR Alloys and Minerals SA to serve the South African ferrous foundry industry. The agreement, which came into effect on the 1st October 2013, will in future see Ceramic and Alloy Specialists market and supply the product range that GfE- MIR Alloys and Minerals were previously responsible for.

"The Board, Management and Staff of GfE-MIR Alloys and Minerals SA (Pty) Ltd have the pleasure in announcing the successful conclusion of an agreement with Ceramic and Alloy Specialists (Pty) Ltd that will see us transferring our well established ferrous foundry business to Ceramic and Alloy Specialists," said Russel Symons, Managing Director of GfE-MIR Alloys and Minerals in South Africa.

"GfE-MIR has appointed Ceramic and Alloy Specialists as its distributor as they are well positioned to provide high service levels to the foundry industry into the future. The combination of Ceramic and Alloys existing products and GfE-MIR's range of bulk alloys, magnesium cored wires and other speciality products will provide the South African foundry industry with a wide product range supplied by a reliable and committed company," continued Symons.

"GfE-MIR has diversified from a trading and distribution company over the last years. Our focus today is on mining, mineral processing, ferro-alloy and metal production activities. GfE-MIR is active in these fields throughout South Africa and Southern Africa. It is for this reason that we would like to continue growing our business in this area of the manufacturing sector, adding value, exporting and exploring other opportunities currently being presented."

"We thank our partners in the foundry industry for the support over the last number of years and confirm that Mike Retief and his team at Ceramic and Alloy Specialists will continue with the supply and support on our products we have been supplying directly."

"This partnership with GfE-MIR will strengthen our product portfolio, distribution and customer support for the foundries in South Africa. In addition we will be able to learn more about our customers and to better understand their needs," said Mike Retief, MD of Ceramic and Alloy Specialists.

"We are excited about the future for the company. We now have access to products that will in effect virtually make us a one-stop shop as a foundry supplier. Most of the products that GfE-MIR has been supplying into the industry are complementary to our range," explained Retief.

"We now regard ourselves as a specialist supplier to the molten metal industry rather than a bulk supplier," continued Retief.

About Ceramic and Alloy Specialists

Ceramic and Alloy Specialists was established in October 1998 representing both international and local manufacturers and supplying the foundry, aluminium smelter and steel manufacturing industries in South Africa.

The company supplies filtration technology and products, ceramic shapes, hollowware, alloys (the noble materials), grain refiners, hardeners, inoculants, nodulisers, insulation type materials, cored wires, ferro alloys, cored wire, refractory materials, aluminium alloying additions, ceramic castings and filters, minor and special metals, minerals, foundry consumables and other niche market products for the primary and secondary markets, including the foundries (ferrous and non-ferrous) and steel manufacturers.

In 2009 the company expanded its product portfolio into capital equipment when it began marketing and sales of all equipment, spares and consumables for a number of international manufacturers and developers of foundry related equipment, consumables and software.

This range includes furnace installations and solutions for foundries with a range of melting, holding and casting furnaces, cold box, hot box and shell core machines and green sand moulding lines, high pressure die casting machines, loading systems, metallurgic treatment stations, metering systems, cast iron transport trolleys, automatic pouring systems, inoculators and other automatic systems, sand reclamation machinery and plant and on the consumable side crucibles.

Ceramic and Alloy Specialists is an Alloys, Metals & Ceramics Holdings PLC (AMC) company, which has 12 international operations. Some of the principals represented locally include Selee Corporation, Hoesch Metallurgie, Elkem, CEDIE, Rath, ICP, Schaeffer, Striko, Foundry Automation, IMF, Kennecott and Mammut.

About GfE-MIR Alloys and Minerals SA

The company began trading as Varomet South Africa (Pty) Ltd in February 2005 as a reliable supplier, marketer and off-taker for a wide variety of commodities distributed across every major metal market. The company underwent a name change to GfE-MIR Alloys and Minerals (Pty) Ltd in 2008.

The company is today primarily active in the metallurgical industry, specialising in ferro-alloys, base metals, carbon products and refractories. The company has four production plants, three in South Africa and one in Zambia. Products are exported globally and the company currently employs 115 people.

GfE-MIR Alloys and Minerals SA is a subsidiary of the GfE-MIR Group. The GfE-MIR Group recently celebrated 100 years of business in Europe.

For further details contact Ceramic & Alloy Specialists on TEL: 011 894 3039 or visit www.ceramicalloy.co.za or GfE-MIR Alloys and Minerals on TEL: 011 740 1034 or visit www.gfe-mir.com ■

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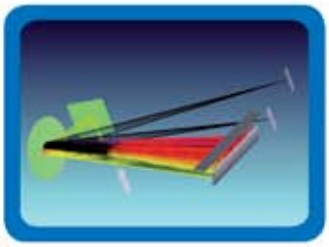

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South African titanium pilot plant established

South Africa has the second largest reserves of titanium bearing mineral in the world and is also the second largest producer of titanium dioxide bearing mineral concentrate.

Apart from concentrating the mineral to produce titanium slag and pig iron, little further value is added to the mineral before exporting it. It is believed that there is significant potential to add value and create much-needed employment if titanium metal is extracted from the mineral concentrate and a new downstream industry is created to manufacture titanium metal components and products.

The Titanium Centre of Competence (TiCoC), established at the CSIR and funded by the Department of Science and Technology (DST), has developed a suite of complementary technologies to help South Africa add value to its vast resources of titanium across the metal value chain. Key to this programme is the development and commercialisation of a novel process for producing primary titanium metal, hence the establishment of a small scale titanium pilot plant on the CSIR campus in Pretoria for the production of titanium metal powder.

The titanium pilot plant is the first step towards a commercial scale plant that will be able to produce titanium powder at a much lower cost than present imports, making this light metal an economically viable option from which many industries can be created and sustained.

A view of the main reduction unit of the titanium pilot plant

Apart from the imperative to prove that the new titanium powder production technology can be scaled up, the pilot plant will also be used to produce relatively large quantities of titanium powder. This powder will be made available for testing to research institutions involved in research and development of titanium metal powder technologies, such as additive manufacturing, metal injection moulding technology, press and sinter technology and direct powder rolling technology.

The pilot plant uses a novel and patented process that is internationally competitive. The unique features of the process provide cost and product quality advantages. Science and Technology Minister, Mr Derek

Guests at the launch were given an overview of the Ti powder classification unit

Dr Sibusiso Sibisi (CSIR CEO), Dr Francis Peterson (Chair of the CSIR Board) and Mr Derek Hanekom (Minister of Science and Technology) after unveiling the plaque at the entrance of the CSIR titanium pilot plant

Hanekom, officially opened the titanium pilot plant in June 2013. The DST has all along been a key stakeholder in this initiative and has allocated more than R100 million for this technology implementation via the TiCoC. The plant is designed to produce two kilograms of titanium metal powder per hour.

Another important technology in the suite of TiCoC deliverables is the investment casting process for titanium. Optimisation of the mould system and melting process are being completed. Casting trials in Germany later during 2013 will provide greater clarity on the capital investment needed to commercialise the technology in South Africa.

Comprehensive documentation of the technology chain is being completed, including a cost analysis of the proses as input to a business plan for commercialisation of the technology with local industry players. Complex components, such as a test component for Boeing, have been successfully cast with tensile strength meeting the specification.

Boeing, the world's largest aerospace company, has recently formalised a collaboration with the CSIR to cooperate on developing ways to incorporate titanium powder into novel industrial manufacturing processes and products by signing a memorandum of understanding with the CSIR, the host of the TiCoC. This mutually beneficial agreement supports the nation's long-term economic development goals that include the supply of titanium to many industries, including aerospace.

For further details contact Lionel Michel of the CSIR on TEL: 012 841 3437 ■

Bringing it all together

Machining operations complemented by the development of in-house foundry at Gear Pump Manufacturing.

Gear Pump Manufacturing (GPM) is located in Cape Town, South Africa and has been involved in the manufacture and assembly of SAE mounted pumps and components since inception. These components include gear sets, shafts, gear housings, end covers, bearing carriers, thrust plates, bearings and bushes, seals, retainers, dowels spacers, keys, fasteners, rings and clips and other small part components.

Approximately 70% of the company's production is exported to countries in North and South America, Europe, the Middle East, South East Asia, Africa and Australasia.

When GPM opened its doors for business in 1985 the company relied on a foundry that was located 'down the street' from its main facility, for its casting requirements.

"Gearings Foundry had always been a reliable supplier and we never had a problem with them. However we had to make a big decision in the company's history when Gearings management shifted the emphasis of their business and we did not fit into their plans going forward. We either had to look for an alternative supplier or open up our own foundry," said Tony Payne, GPM founder and MD, at the time.

"We decided to go the in-house route because we did not want to end up in the same position again. Additionally we did a feasibility study and found that potential suppliers were just too far away from us. We realise that the foundry business is not our core business but the move is also a strategic one in that not only will we be in control of our own destiny, but will also improve our costs, our competitiveness and boost our profitability," said Payne.

That decision was taken back in 2001 and current management says thank goodness Payne and his colleagues had the foresight and were brave enough to move into the foundry industry. Since then the GPM foundry, known then as Engineering Technology Services (Pty) Ltd, has flourished and Gearings Foundry, which was established in 1876 and changed its name to CME Foundry in 2005, ended up on the scrap heap in 2009.

In order to accommodate the foundry a new building was constructed on the existing GPM premises in Epping Industria, Cape Town.

GPM management: Gerry Coward, Mark Franklin and Ken Barnard

Two one-ton Inductotherm melting furnaces with VIP controls were sourced from the UK and core shooters, a sand mixer and a shotblast machine were acquired from Gearings. A new sand plant, a turnover strip machine and a vibrating table were ordered and soon GPM had their own foundry up and casting. Although they had been getting their castings made via green sand at Gearings, with their new foundry GPM decided to change to a furane resin based sand system. The foundry also reclaims most of its sand.

More recently the company has invested in an Oxford Instruments spectrograph.

Initially the foundry had a compliment of eight staff but this has now grown to 29 on a single shift basis. So have the tons of metal cast per month. Twelve years ago 35 tons of grey iron and SG castings were cast on average per month. This has now grown to a 70 to 80 ton yield or 60 tons of saleable castings per month with a mix of 40 percent CGI and SG castings and the remainder made up of grey iron.

Without the pressure of having to supply castings outside of the business, the company still manufactures on a 'just in time' basis to suite their own requirements. The company also

Metal being transferred to a ladle. The foundry makes use of two one-ton Inductotherm melting furnaces with VIP controls

The moulding floor

the A team

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A general view of the foundry

has over 200 different patterns in its store and some castings manufactured weigh up to 21 kilograms.

Machining and assembly

The primary focus of the business is the manufacture, assembly and repair of SAE mounted pumps and components. As this side of the business has grown so has the foundry. Physically, the foundry has been expanded by more than 50% since its inception in order to cater for the increased volumes.

Sustained and rising demand for scrap metal has made prices climb worldwide, particularly for the premium grades of scrap so valuable to primary steelmakers and iron and steel foundries. With this in mind and in the interests of the environment and to further contain costs, the company has invested in a swarf pelletising machine. Consequently, a large portion of the foundry raw material is obtained by pelletising iron and steel swarf and off cuts from the GPM machining facility. Bronze castings for the machining of thrust plates are produced in a similar fashion. Reclaimed machining coolants and cutting oils are also recycled.

The foundry enables GPM to ensure the quality of the castings that are used in the product range, which includes hydraulic bushing pumps, bearing gear pumps, power take offs and some valves. Up to 10 000 castings of various shapes, sizes and weights are manufactured monthly and the synergies can be clearly seen between the foundry and machine shop.

Before the castings can be used they must undergo precision machining and as a result GPM has been equipped with numerous state-of-the-art CNC machines and specialist task performing machines. On the shopfloor there are 13 machining centers, six CNC lathes, two CNC angle approach grinders, a surface grinder and six gear hobbing/shaving machines.

With the numerous amounts of and the variety of castings needed to be machined every day the machine shop is operating three shifts a day, five days a week. However it is not just machining castings. Forgings and bar stock are also amongst the mix.

Assembly, testing and other operations are also an important aspect of the company. For example it has its own deburring department using ceramic abrasives and additionally there is the heat treatment department.

More recently the company has invested in an Oxford Instruments spectrometer

The volumes of pump assemblies have more than quadrupled during the last few years and this necessitated the construction of a new and substantially larger pump assembly area, as well as new and upgraded test stands. All assemblies are tested on computerised test stands, which have multiple flow, pressure, temperature and speed testing capability.

The shop continues to add to its wealth of internal manufacturing capabilities as needs arise. Having nearly all requisite processes in-house and performed by trained shop personnel not only allows quicker deliveries to customers, but helps to ensure that the documentation is properly maintained for every job.

Quality assurance

The company been accredited in accordance with the ISO 9001-2008 standard since 1992 and the quality management system makes use of statistical analyses to determine manufacturing process capability. The stability of manufacturing processes is continuously monitored and managed via machine run charts. In line with GPM's technology investment philosophy, they have recently invested in a 3D co-ordinate measurement machine. This has increased productivity by means of faster first-off measurement as well as enabling expanded statistical sampling checks.

History of Dosco GPM Holdings

Tony Payne, who is now retired, established GPM in 1985 and was instrumental in establishing the foundry in 2001. Before that the company tied up with Dosco Precision Hydraulics (established 1989), a company focused on

Sustained and rising demand for scrap metal has made prices climb worldwide, particularly for the premium grades of scrap so valuable to primary steelmakers and iron and steel foundries. With this in mind and in the interests of the environment and to further contain costs, the company has invested in a swarf pelletising machine. Consequently, a large portion of the foundry raw material is obtained by pelletising iron and steel swarf and off cuts from the GPM machining facility. Bronze castings for the machining of thrust plates are produced in a similar fashion. Reclaimed machining coolants and cutting oils are also recycled

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The core making department

GPM runs on a furane resin based sand system. The foundry also reclaims most of its sand

hydraulic pump repair and remanufacturing, based in Johannesburg. Together the companies formed Dosco GPM Holdings (Pty) Ltd in 1998.

In 1999 Dosco GPM Holdings acquired a 100% interest of Debex Cape (Pty) Limited (established 1988) which was renamed (GPM) Gear Pump Manufacturing (Pty) Limited. GPM manufactures a comprehensive range of both bearing and bushing cast iron gear pumps / motors and flow dividers.

The holding company is continuously searching for ways to improve service levels and effectiveness throughout the world. In 2000 (GPD UK) Gear Pump Distributors (UK) Ltd, located in Bromsgrove, Midlands, was created to distribute the GPM product throughout the United Kingdom, Europe and the Middle East. This dedicated pump workshop is able to assemble, test and despatch units the same day.

In 2003 (GPD AUS) Gear Pump Distributors Australia (Pty) Ltd, located in Sydney, was created to distribute products manufactured by GPM into the Asia Pacific region.

In 2004 (MTS) Manufacturing Technology Services (Pty) Ltd. was set up to manufacture specialised housings, shafts and couplings primarily for DPH. As such, MTS is a specialist machine shop and is equipped with all the necessary machine tools to perform this function. This concept proved very successful and MTS now performs work previously done by subcontractors and to a higher quality standard and quicker turnaround time.

Precision Hydraulics International was established in 2008 to oversee the Groups international operations.

Dunford Holdings

In 2011 Dunford Holdings acquired a majority shareholding in Dosco GPM Holdings. Dunford Holdings is based in Durban and is headed up by brothers Tommy and Graham Dunford. Included in the Group is another foundry - Jos Grieveson – a versatile KwaZulu Natal foundry producing ferrous and non-ferrous castings for the sugar, valve, mining, heavy duty vehicle, motor, crusher, shipping and general engineering industries in KwaZulu Natal, as well as Gauteng.

Since the acquisition, all companies have been consolidated under one group structure although they continue to trade under their individual names.

For further details contact Gear Pump Manufacturing (GPM) on TEL: 021 531 9330 or Dunford Holdings on TEL: 031 507 3640 or visit www.gearpumps.co.za ■

IDC seeks foreign investment for steel plant

The Department of Trade and Industry is waiting for a progress report on "complex" negotiations around a new steel plant for South Africa involving the Industrial Development Corporation (IDC). While the details remain undisclosed, the talks are part of a fast-changing South African steel industry in which the government wants to see an increase in competition, according to newspaper reports.

Since the unbundling of the former state-run Iscor iron-ore and steel interests after 2000, South Africa's steel market has been dominated by ArcelorMittal SA, a unit of the global ArcelorMittal group.

The department says international investors are ready to help establish a new joint-venture steel mill in South Africa. While negotiations are likely to be finalised by the second quarter, talks remain incomplete. "If the deadlines hoped for have not been met, it is not for lack of trying," says acting deputy director-general for industrial development at the department, Garth Strachan.

He says the talks are "complex" and "very sensitive", and involve large sums of foreign direct investment (FDI) and private equity.

They also involve cost effectiveness, natural resources, logistics, the most appropriate technologies, and environmental considerations. "The critical question is whether (South Africa) can get competitive steel."

The price of South African steel is in the highest quartile globally as a result of "import parity pricing" — local suppliers setting prices to match the cost that would be incurred if customers imported the goods. The government wants steel prices to be in the lowest global quartile. To this end it went so far as to award ArcelorMittal SA's partial mineral rights at major iron-ore supplier Kumba's Sishen mine to Imperial Crown Trading, a non-mining company with links to the Presidency. These matters remain under court and arbitration processes.

Meanwhile, South Africa's steel prices stay higher than many would like. The government is now weighing a tariff on exports of scrap metal, and exports of other significant steel inputs, including coal.

Notwithstanding the concerns over high steel prices, Mr Strachan says average tariffs in South Africa's economy have been reduced from 28% in 1990 to 7% in 2011. "(South Africa) is one of the least-protected economies in the world in terms of tariff protection," he says. Steel tariffs are zero, and department studies "suggest" this has reduced the price of steel in South Africa.

The IDC recently bought a 74% stake in Scaw Metals from Anglo American for R3.4 billion. Scaw says it wants to capitalise on infrastructure expansion in South Africa and the rest of Africa. Russian-backed global minerals and manufacturing group Evraz has, meanwhile, announced plans to sell 85% of South African steel and vanadium producer, Evraz Highveld, for nearly R3 billion to little-known empowerment consortium Nemascore. The Investec group also says there is strong global interest in buying up Macsteel Service Centres SA — Africa's biggest steel distributor.

The South African and international private sectors are "critical players" in such ventures, says Mr Strachan. "(The state) can steer but cannot grow the (steel) sector. The private sector has to come to the table," he says. But such negotiations are complex, particularly when government wants to impose strict "conditionalities" on strategic FDI, especially to create jobs.

Critics contend there is already a glut of steel capacity in South Africa, despite R4 trillion infrastructure plans. They also say there is a lack of policy cohesion across state departments and agencies, and that development is hampered by rigid labour laws and increasingly rigid empowerment legislation.

Other proposed steel projects have gone nowhere. Early in 2011, empowerment group Afripalm Resources signed a memorandum of understanding with the state-run Steel Authority of India to conduct a feasibility study for a new R21 billion steel plant in South Africa. About that time, Gauteng's government announced its support for a project led by Asambe Steel, a black economic empowerment vehicle, to build a R1 billion steel mill in Ekurhuleni.

Lionel October, director-general of the department, says the Indians have recently "shown less interest" in such projects, although giant South Korean steel maker Posco might step into the breach. He says a feasibility study for a new steel mill in South Africa is either "completed or close to completion".

Meanwhile, the department acknowledges that South Korea's Samsung is in talks to set up an electronics factory in South Africa, to produce a "whole suite of goods", and possibly situated at Dube TradePort in KwaZulu-Natal. "Yes, I know about Samsung's interest, but I don't think they have decided finally on a location," Mr October says. The Dube TradePort says it has "no comment on this currently". The Coega Development Corporation says it has not heard of such a project. It also says a costly manganese smelter announced by Kalagadi Manganese in late 2011 is still in the environmental planning stage. ■

New casting material for low-temperature applications

Cold? No problem! Martensitic grade for thinner-wall castings has effect.

Particular demands are placed on steels that are used in the low temperature range – they have to withstand temperatures down to -196 °C. To date, austenitic steels have been used. However, because of their low yield strength, these are subject to the risk of early deformation and must therefore be cast with very thick walls.

This was the starting point for the development of the new low-temperature material DUX CRYO®, which displays significantly higher strength values with good toughness. The advantage for use: the casting can be constructed with thinner walls, which saves not only on weight but also on costs.

Instead of austenitic steel, Schmolz + Bickenbach Guss has recently started using martensitic steels for jobs in the low-temperature range – this is the result of an extensive research project funded by the German federal ministry of economics and technology. These materials are excellent for tempering and therefore also display significantly higher yield strength (Rp0.2 ≥ 490 N/mm²) than the alternative of austenitic steels – a property that is particularly advantageous in such extreme temperatures. However, particular demands are placed not only on the strength but also on the toughness (KV (-196 °C) ≥ 40 J). The prerequisite for high strength at low temperatures is primarily a low content of selected trace elements. Otherwise, the segregations caused result in embrittling of the casting.

"For us, the challenge lay in achieving reliable manufacture of the castings with a focus on optimised structure and therefore adequate strength – without cracks appearing in the casting volume," Dr Petra Becker, head of research & development at Schmolz + Bickenbach Guss, explained.

The starting point for the research project was the low-temperature material X8Ni9, which is used as a standard sheet and forging material for applications down to -196 °C. However, due to the high cracking sensitivity of the coarse-grained primary structure, no casting alternative to the material existed previously. The aim was to present the material as a casting modification by combining findings from analytics, metallurgy and heat treatment. In addition to extensive materials testing and comprehensive literature research, this also involved co-operation with external experts.

A ship transporting liquid gas

The latest technologies were used here, e.g. a casting technology simulation, thermodynamic calculations of the material and heat treatment, and the latest methods of analysis for the investigation results. Consequently, one of the findings was that the requirements in terms of purity of the input substances and in terms of melting and shaping technology are particularly important.

Additionally, the heat treatment parameters must also be set extremely precisely. Based on the findings, experimental production was then undertaken – from melting and casting through heat treatment to mechanical testing. After casting, the castings were subjected to extensive checks. In addition to visual and colour penetration checks, these included ultrasound and x-ray examinations. It was possible to demonstrate here that the alloying concept together with the selected cooling conditions really does produce crack-free castings.

Furthermore, a series of heat treatment tests took place in order to optimise the mechanical values. The result of this series of tests is the new low-temperature material DUX CRYO®. This stands out for its increased yield strength and outstanding low-temperature strength. The casting can therefore be designed and constructed with significantly thinner walls. This allows greater design freedom, saves on weight and costs, and moreover conserves resources.

"Because of the chemical composition, the new material is more advantageous than austenite – with a similar nickel content, it contains no chromium. A further advantage: it can be mechanically processed with no problem," said Becker.

Diverse applications

The new material DUX CRYO® is suitable for all areas in which work is carried out at temperatures between -100 °C and -196 °C and therefore e.g. wherever cryogens such as dry ice or liquid oxygen and nitrogen are used. This applies including for air liquefaction and separation systems, in which air components are separated using thermal separation processes to extract nitrogen, oxygen, argon and other noble gases in high-purity concentration as well as in liquid and gaseous form.

Another application with a promising future is the liquefaction of natural gas: here, the natural gas is cooled to as low as -164 °C in so-called LNG terminals – the demands on the components used are accordingly also high. Similar demands apply for cold grinding and cryogenic recycling. These processes are used e.g. in the food industry and in the area of composite materials. The aim here is the grinding of materials with a low softening point.

"This material could also have interesting potential in the areas of soil freezing, industrial refrigeration technology and oil sands extraction. The same applies for all components that are used at low external temperatures, whether pumps in Alaska or deep-sea offshore applications," said Becker.

For further details email v.jansen@schmolz-bickenbach.com or visit www.guss.schmolz-bickenbach.com ■

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THE EVOLUTION OF TECHNOLOGY

Omega Mixers - Leading the Way for over 50 Years

The things we use in everyday life are constantly evolving into better, more useful objects that we just can't afford to be without. For foundries the same can be said for the machinery that can help to keep them efficient and profitable.

Omega mixers are efficient, reliable, easy to programme and able to produce detailed reports about materials consumption and materials costs.

All displayed on a colour touch-screen interface so that production and consumables can be constantly monitored and recorded. The result is increased production efficiency, reduced material consumption, improved consistency of quality and a de-skilled operation.

Make sure that you stay ahead of your competitors with Omega Foundry Machinery Mixers.

Omega Foundry Machinery Ltd is exclusively represented by: Mondeco Solutions (Pty) Ltd
Johannesburg, South Africa
T: +2779 448 1277 E: info@mondeco.co.za

Mondeco

Omega Foundry Machinery Ltd,
Morley Way, Peterborough, PE2 7BW, United Kingdom
T: +44 (0) 1733 232231 F: +44 (0) 1733 237012
E: sales@ofml.net W: www.ofml.net

American Colloid
unveils AMCOL Metalcasting

The Metalcasting Products Group of American Colloid Company, Hoffman Estates, Ill., USA has unveiled its new brand. AMCOL Metalcasting mirrors global parent company AMCOL International. The updated brand will appear across all marketing collateral, advertising and social media platforms.

An aerial view of the AMCOAL Blatlhako plant and mine near Rustenburg, which manufactures the Hevi-Sand® foundry chromite sand. This photograph was taken in May 2011 before the construction of phase 2 had commenced at the plant in 2013. The $5 million (R40 million) upgrade to improve quality and throughput of foundry grade chromite sand was completed last year

With origins as American Colloid Company, along with establishing Volclay® as the global standard for premium foundry-grade bentonite, AMCOL Metalcasting has evolved to become the leading provider of green sand molding materials for the metalcasting industry for over 85 years. Their high-quality green sand bonds, specialty chromite sands, and resins, paired with a global network of technical support specialists, provides foundries with a unique solutions package unlike competing companies. Their unique ability to evaluate foundry operations, diagnose problems, and provide customized solutions, provides added value above and beyond their quality products.

AMCOL Metalcasting's customised solutions are designed to enhance casting production and performance and are used worldwide by both small and large-scale metalcasting foundries. The complete product range consists of bentonites, customised performance blends, chromite sand, cellulose, specialty carbonaceous materials, and ferro-alloy bricks and briquettes, in addition to specialty metal treatments for non-ferrous foundries.

One of AMCOL Metalcasting's most unique products is the Hevi-Sand® specialty chromite sand. Hevi-Sand® chromite sand is a versatile, unique aggregate tailored for traditionally difficult metalcasting applications. Selectively mined from the company's own mine in South Africa, the unique characteristics and proven performance of Hevi-Sand® results in reduced costs and provides high-quality castings with excellent surface finish.

Weigh feeder equipment, designed to maintain a pre-determined flow rate of product and eliminate over and under supply of product when bagging. This ensures higher accuracy during dispatch and gives the company traceability of product over any given time

AMCOL Metalcasting also provides LOVOX®, a uniquely formulated, urethane binder system which offers significantly reduced VOCs, HAPs, and virtually no mixed sand odour. Its unique chemistry provides superior casting performance in non-ferrous applications.

For further details contact Volclay South Africa on TEL: 011 958 1667 or Arrie Schriek on 082 798 5219 or visit www.hevi-sand.com ■

Save the DATE

FENAF 2013 — 15th Latin American Foundry Fair
15th - 18th October 2013 • São Paulo, Brazil

The Associação Brasileira de Fundição, ABIFA, is presenting FENAF 2013 (15th Latin American Foundry) and the CONAF 2013 (16th Congress Foundry) at Expo Center Norte, in São Paulo, Brazil. With the participation of over 400 companies from Brazil and other countries, the largest Latin American event of the foundry sector draws together a market worth US$11.4 billion, bringing to the region key trends and technologies related to iron, steel and non-ferrous casting, and to all foundry processes.

The event includes the trade fair FENAF and congress sessions CONAF featuring more than 600 exhibitors and over 36,000 visitors. The presentations in the congress, and the exhibitors, will expose metal casters to the latest technology, ongoing research and successful management tools that will assist companies in enhancing their competitiveness.

For further details visit www.fenaf.com.br

13th International Conference on semi-solid processing of alloys and composites
15th – 17th September 2014 • Muscat, Oman

The S2P International Conferences are dedicated to the science and processing technology of semi-solid processing of metals and composites. They are a forum for scientists, engineers and manufacturing specialists to learn from each other, to share, to disseminate knowledge, and to develop a mutual perspective about topical fundamental issues.

The 13th International Conference on semi-solid processing of alloys and composites, S2P 2014, will take place from September 15th to 17th 2014 at GUtech (German University of Technology) in Muscat, Oman. A scientific committee will review all manuscripts submitted, in order to ensure that the conference is of the highest quality and that the papers are technical and professional, with minimum commercialism. A local organising committee oversees the details and logistics and hosts the Conference.

For further details visit www.s2p2014.gutech.edu.om

Valve World Expo 2014
2nd - 4th December 2014 • Düsseldorf, Germany

Exhibitor applications for Valve World Expo 2014, 9th Biennial Valve World Conference & Exhibition, are now available online at www.valveworldexpo.com. The exhibitor applications can only be filled out online – no hard copies will be available. The event will be held from December 2 - 4, 2014 at the fairgrounds in Düsseldorf, Germany. The exhibitor registration deadline is April 1, 2014.

Exhibit categories at Valve World Expo 2014 will include valves, valve components and parts, actuators and positioners as well as pumps, compressors, engineering services and software. The concurrently held Valve World Conference will again be organised by KCI Publishing/Netherlands, featuring workshops and specialist presentations on valve and fittings related topics as well as new trends and designs. The special characteristic of Vale World Expo 2014 will be the strong connection between the exhibition, the conference and the resulting networking opportunities.

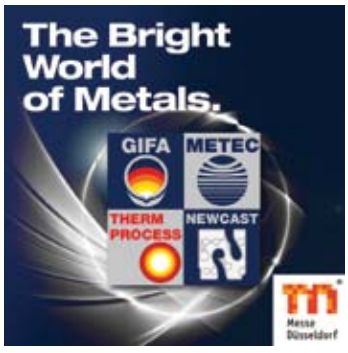
When Valve World Expo was last held in 2012, 10 300 trade visitors from more than 50 countries attended to get information on state-of-the-art in industrial valves and fittings from 593 international exhibitors from 37 nations. The supporting expert conference was also a resounding success, attracting 350 participants to its approximately 60 lectures and workshops. About 70% of the trade visitors at Valve World Expo 2012 came from countries other than Germany and this significant increase of international attendees confirms Valve World Expo's status as the No. 1 platform of the entire industrial valves and fittings sector. The European trade fair visitors came primarily from Italy, the Netherlands, Great Britain, France and Germany. The majority of the overseas visitors were from India.

To sign up as a Valve World Expo 2014 exhibitor visit www.valveworldexpo.com

GIFA, METEC, THERMPROCESS, NEWCAST
16th - 20th June 2015 • Düsseldorf, Germany

The international trade community will be able to experience the four successful technology trade fairs again in Düsseldorf from 16 to 20 June 2015. Project Manager Friedrich-Georg Kehrer: "We are delighted to have found another date in the early summer, which will certainly help to create a good atmosphere for discussions and business transactions in the halls on the exhibition site."

The last "Bright World of Metals" set a new record for the trade fairs, with about 2,000 exhibitors, 78,558 square metres of stand space and 79,000 visitors from 83 different countries. The events held last year therefore had a strong impact on the foundry technology, metallurgy, thermo process technology and castings industries that exhibited there too.



Trade Fair Travel and Castings SA tour

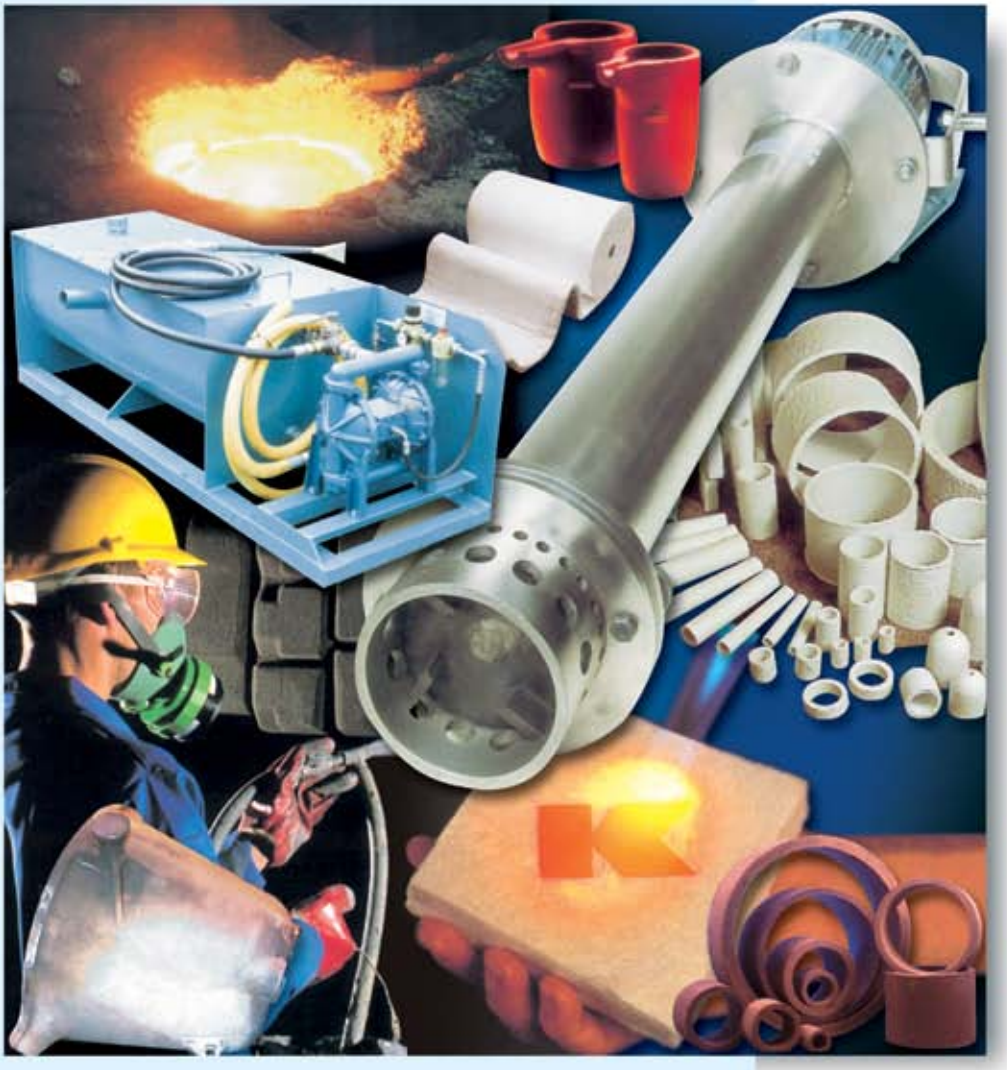
Trade Fair Travel, a specialist travel agency for trade fairs internationally and in particular Germany, have put together a very reasonable tour package to visit this exhibition.

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

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

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

QUALITY FOUNDRY PRODUCTS



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Chromite separation solution and equipment – Omega Foundry Machinery

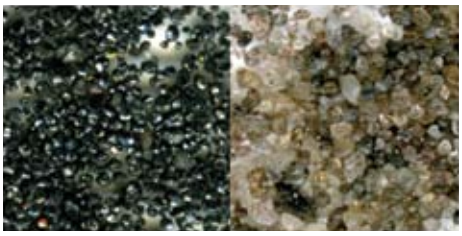
Omega Foundry Machinery have recently supplied chromite separation equipment to a foundry in the UK, a system that provides up to 99% pure reclaimed chromite sand by using a combination of drum magnet separators and a fluidised density separator, according to the company.

The foundry produces castings in over 200 compositions of carbon, alloy and stainless and nickel based alloys. They supply to the petro-chemical, oil & gas industry as well as structural, offshore, tunnelling, mining and steel plant applications.

Previously the foundry had a single rare earth drum magnet that was used to remove as much chromite sand from the reclaimed silica sand as possible (prior to thermal reclamation) and then dispose of it. The intention of the foundry was to invest in new equipment in order to recover as much good quality chromite sand as possible from the moulding sand so that it can be effectively re-used at the mixer.

The problems faced

The problems faced by the foundry was that because chromite sand is para-magnetic, that is it is only slightly magnetic it (chromite sand), cannot be effectively removed by standard rare earth magnets without contamination of the metal and the silica. Even with a series of drum magnet separators, what tends to happen is that there is always a carry-over of silica sand making the quality of the reclaimed chromite poor and only suitable for dumping.



Pure chromite sand *Silica sand containing chromite*

The solution

Omega installed a system that provides up to 99% pure reclaimed chromite sand by using a combination of drum magnet Separators and a fluidised density separator.

Silica sand and chromite (prior to separation)

Separation taking place

Reclaimed chromite sand (after separation)

Principle of operation

Fully attrited and cooled sand is held in a "dirty sand silo" and is discharged onto the in-feed electromagnetic feeder for an even and controlled feed over the primary ferrite drum separator. The feeder ensures that the product is thinly spread over the drum to enable maximum effect from the magnet.

The ferrite magnet removes all of the metallic particles from the sand, including chromite gangue, which is rejected allowing the remaining sand mix to then pass to a second electromagnetic feeder (chromite sand and silica sand blend). The second electromagnetic feeder provides feed to a high intensity magnet, which attracts the para-magnetic chromite from the fused silica/chromite sand mix.

The reject from the rare earth magnet is mainly silica sand, discharging to a surge hopper and pneumatic conveyor, which is then transported back to the moulding shop as mechanically reclaimed sand to the silica sand storage hopper for re-use.

Both magnetic drums have an adjustable gate within the casings allowing the sand streams to be finely tuned, the metallics from sand on the ferrite magnet and the chromite from silica on the high intensity magnet. The magnetic quadrant can also be adjusted in respect to its position, for maximum recovery.

The chromite product containing chromite, fused silica/chromite passes to the fluidised density separator. This material is automatically discharged onto a third electro-magnetic feeder, in order to ensure the product remains evenly spread. Discharge via a chute is onto the fluidised separator.

Fluidised air is supplied from a high-pressure side channel blower, which keeps the volume precise. Air is also filtered prior to fluidisation to prevent the membrane from blocking.

The chromite sand particles being heavier are not lifted by the fluidising air and are driven forwards by the vibratory line of action of the motors. The reject particles being lighter are lifted off the membrane by the fluidising air. This prevents the particles being driven forward by the vibratory line of action of the motors onto the membrane. As the deck is inclined the lighter sand will flow backwards over the weir. The line of action and angle of the fluidised separator are adjustable to enable a precise split to occur. As material AFS and sieve analysis can be similar, there will be a small percentage carryover, but not excessive to cause re-use issues.

The fluidised separator has three product streams. The first is a waste stream of fused silica and any other waste that has managed to pass over the magnets. The second stream is reclaimed chromite sand. The third stream is any agglomerates that have inclined with the chromite and are rejected as the chromite product passes through an integral mesh panel bonded within the body of the separator. This chromite product can then be collected in big bags for re-use or collected in a surge hopper and conveyed pneumatically to chromite sand storage.

The plant is controlled from a main control panel with PLC and HMI, fully interlocked and with level probes at appropriate points for level and system control. The plant is designed to be fully automatic and self-supervising with no running adjustments or regulation necessary once commissioned.

Conclusion

The separated chromite sand contains less than 0.5% silica contamination and therefore is perfect for re-use at the mixer. As a general side effect from the casting process, the chromite sand tends to see most of the heat from the molten metal and so is also naturally thermally reclaimed.

The foundry now blends the reclaimed chromite with new chromite at a ratio of 50/50 and uses it on the pattern face as chill sand as well as in the cores. Chromite dumping has been virtually eliminated and new chromite purchasing has been drastically reduced as well.

For further details contact Peter Petersen of Mondeco Solutions on cell 079 448 1277 or email peter@mondeco.co.za or visit www.mondeco.co.za ■

Phenom-World unveils the third generation Phenom desktop SEM

With the introduction of the next generation Phenom ProX desktop SEM Phenom-World confirms its position in the top of the high-end table top for SEM imaging and analysis. With a magnification range up to 100,000x and resolution of 17nm the Phenom ProX delivers more detailed information than ever before.

All-in-one system

All Phenom-World scanning electron microscopes are intuitive to use, compact, fast to create results and built to high quality standards. The most extended solution in the range is the next generation Phenom ProX. The advanced system identifies different elements in a specimen by using the integrated Element Identification software with a specially designed EDS detector. With new techniques and software-developments, the magnification range has been extended from max. 45,000x to 100,000x magnification. Combined with a resolution of 17nm, the next generation Phenom ProX is a valuable instrument for a wide variety of applications.

Fully integrated EDS solution

The specially designed and fully integrated EDS detector combined with integrated software package makes the Phenom ProX the most extended solution for fast and user friendly imaging and analysis. The EDS-technique analyzes X-rays generated by the electrons from the electron beam interacting with the sample. The Phenom CeB6 electron source generates the highest number of X-rays in its market segment. The fully integrated Element Identification software package allows users to identify any hidden elements within a sample via the point-and-shoot functionality. Additionally, the software can be expanded with a combined Elemental Mapping and Line Scan option.

Elemental Mapping reveals the distribution of elements within the sample. The selected elements can be mapped at a user-specified pixel resolution and acquisition time. Elements can be added or removed at any time during or after the mapping process. Line Scan allows analysis over a selected line. The results can easily be exported and reported.

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

Oxford Instruments extends range of spark emission spectrometers

Oxford Instruments recently introduced two new spark emission spectrometers.

The Foundry-Master Xline and the PMI-Master range support foundries and metal producers in determining metal samples fast and accurately, embracing both mobile and stationary analysis needs.

The stationary spectrometer Foundry-Master Xline has been developed specifically to meet the needs of the metals and steel markets. It is used for quantitative elemental analysis of metal samples and is designed as a bench top unit. The high-resolution Multi-CCD optics are equipped with a vacuum chamber to cover the complete wavelength range from 165 to 780 nm, offering precise detection of all relevant elements in Fe and other matrices. This reliable entry level laboratory spectrometer is competitively priced and offers performance and practical features usually only found with premium class instruments.

The latest addition to Oxford Instruments' mobile PMI-Master range is the PMI-Master Compact, which is a robust, mobile optical emission spectroscopy metal analyser. It is the smaller, price attractive version of the market leading PMI-Master Pro metal analyser. The PMI-Master Compact offers rapid material verification, PMI, and to keep it simple, sorting of the most common alloys; steel, aluminium, copper and nickel.

The PMI-Master Pro is a high performance analyser for positive material identification, especially designed for the metals inspection industry, quality control systems and safety procedures.

The UVtouch probe for the PMI-Master Pro allows the analysis of Nitrogen directly on the spot. In combination they offer high accuracy and stability of analysis in varying environments – especially for low C, P, S, Sn, As and B concentration in steel. The detection of Nitrogen is essential for the positive material identification of duplex and super-duplex steel grades. These alloys are characterised by a certain amount of Nitrogen (0.1 – 0.8%) to improve strength and corrosion resistance. Duplex steel, one of the leading prospective materials, is used extensively in chemical and petrochemical plants and can now be monitored by the PMI-Master PRO in combination with UVTouch.

For further details contact Monica Galliford Van der Merwe (Sales Manager) at SMM Instruments on TEL: 011 540 6000 or visit www.smmafrica.com or www.oxford-instruments.com ■

Special coating for aluminium die-casting improves service life of dies - ASK Chemicals

For suppliers to the automotive industry, the production of cast aluminium parts by means of gravity and low pressure die-casting is of high technological and economic importance. With precisely these requirements in mind, ASK Chemicals have developed a semi-insulating die coating Solitectm AD 901, a highly efficient water-based coating that offers major economic advantages in foundry processes thanks to its extremely long service life.

In addition to ensuring that moulds are filled completely, controlling the solidification of the cast part and protecting the mould surface, Solitectm AD 901 offers another key benefit. The service life of the dies is more than 50 % longer than when other standard coatings are used, according to ASK Chemicals. This prolongs the intervals required for die coating and maintenance and, therefore, increases the availability.

The comparatively high graphite content of Solitectm AD 901 also significantly reduces the ejection forces and hence the loads on the mould surfaces. Even production downtime lasting up to four hours does not have any negative impact on the quality of the coating or cast part. The economic impact of this is longer usage periods with reduced maintenance costs.

At ASK Chemicals, more than 90 chemists, engineers and technicians on three continents are hard at work responding to the requirements of suppliers of aluminium cast parts.

For further information contact Applied Casting Solutions on TEL: 011 922 1701 or visit www.chemsystems.co.za or www.ask-chemicals.com. ■

Metal recycling shredder systems – Metso Recycling

Industry and households constantly produce huge amounts of residual and scrap metals that must be recycled. The recycling of metal starts with the collection of the residual waste metal. The way the collected metal is processed depends on the size, density and purity of the scrap metal.

Processing recyclable scrap involves size reduction and shearing. Scrap metal is processed by pressing, crushing, shearing and sorting. Large metal pieces, such as the metal from junk cars, must be made smaller and then separated and cleaned so that the metal can be reused. Scrap metal that is very small in size must be pressed together to prevent the metal from oxidizing and so that it can be reused. The processed scrap metal is melted down into new steel at foundries and steel mills.

Sorting is the process of separating the different metals and other materials. This is done using magnets, eddy current separators, screening, blowing/suction (air classifier), flotation (gravitational separation), optical separation and manual separation.

The Lindemann Eta® shred

The TS Power® Shred 69/90

Shredder systems

Metso Recycling have a long history of designing and implementing bespoke solutions for the metal scrap processing industry. Their solutions encompass all aspects of shredder plant design, from infeed equipment, to the latest in ferrous and nonferrous downstream processing plants.

Shredders from Lindemann and Texas Shredder

Metso Recycling metal shredders (Lindemann and Texas Shredder) crush any type of metal, ranging from light to medium-heavy mixed scrap. Characteristic features of Metso's scrap shredders include high throughput capacity at specifically low energy consumption, and long service life.

All their machines offer compelling performance, flexible applications and low maintenance and repair costs - regardless of the type of material processed. Metso's many years' experience in the field of shredder plants is reflected in the fact that their machines are sold the world over, whether you wish to process aluminium, electronic or different types of steel.

Metso Recycling also offers a range of pressing (including baling and briquetting presses), crushing and shearing equipment and solutions.

For further details contact Simon Bosman or Theo du Plooy on TEL: 011 961 4000 or visit www.metso.com ■

Automated iron pouring system

Customised, integrated, melt shop package increases speed, efficiency.

The Sert Uceram system available from Foseco is a 100% automated system that increases the speed and efficiency of pouring and molding lines. It will increase an iron foundry's yield through precision pouring while also improving casting quality. The system can be installed on any pouring vessel (furnace or ladle-type), and any molding line (horizontal or vertical).

Also, the Sert Uceram system reduces manpower requirements in the control room, and it improves process control when used together with Ucelog software. It can be bundled with other systems, equipment, consumables, and service functions to create customized, integrated, melt shop solutions for iron foundries.

Since it was launched in 1996, about 80 Uceram units have been sold to some 40 foundries. The package is comprised of:

- An electric actuator for stopper driving
- An advanced pouring controller
- An optical sensor, based on a multi-measurement image analysis device that can feed the controller with real-time information from the pouring area (e.g. iron level in the cup, stream width, nozzle leakage, etc.).

In addition, several options are available for Uceram systems that all contribute to improved iron control, traceability and quality. These include:

- Automatic positioning of the pouring machine
- Measurement and control of metal level in the channel
- In-stream temperature measurement, inoculant feeding and inoculation checking
- Adjustment of iron temperature at the pouring point

For further details contact Foseco South Africa on TEL: 011 903 9500 or visit www.foseco.com ■

Tired of using mechanical counters? New instrumentation offers smooth integration into your process…and no moving parts.

Endress + Hauser's

Promass E 200 two-wire Coriolis flowmeters

As a long-term user of mechanical sensors such as positive displacement meters or turbines for flow-metering applications, who better than you knows the serious disadvantages of these: moving parts cause drift over time, they are subject to wear and therefore require all too frequent maintenance in order to avoid the risk of breakdown — even the filters require periodic attention.

Endress+Hauser can assist to reduce periodic maintenance of your instrumentation without influencing process availability. The solution Endress+Hauser offers is to use counters with no moving parts, offering better performance and a reduction of the Total Cost of Ownership (TCO) compared to their mechanical counterparts. How would you like a sensor that you could easily install in your existing application that would offer reliable event diagnosis according to NAMUR?

Is it time to consider a replacement?

Consider replacing your mechanical counter with the Promass E 200 Coriolis flowmeter. This two-wire loop-powered (4-20mA HART) device offers seamless mechanical, electrical and digital integration to existing sites, providing an excellent solution to process modernisation.

Maximise your process performance

This Coriolis flowmeter simultaneously measures mass, volume, density and temperature: you don't need to combine several device technologies. Measuring either volume or direct mass, the device offers linear accuracy and higher repeatability. Hydraulic losses are reduced. The high resonance frequency enables total immunity to process vibrations. The detection of build-up increases process reliability.

"Is this device really for me?"

The measuring principle is completely applicable to homogeneous single-phase fluids (viscosity < 20000cP), solutions that include dissolved substances and batch applications lasting more than 10 seconds. For other applications, please contact the Endress+Hauser sales team.

Designed according to SIL IEC61508, the Promass E 200 fits for SIL2 or SIL3 safety applications. Intrinsically safe or explosion-proof options meet the major hazardous area application requirements (ATEX, IEC, CSA, NEPSI, TIIS, etc.). The solution meets the requirements of the chemical, oil and gas, and life sciences industries.

Easy and cost-effective inline installation

The measurement is not influenced by the medium's viscosity and the flow profile, therefore no inlet run is required. Better still, no holder and no filtration is required! You can use existing HART cabling to connect the sensor to the network (PLC, remote I/O, etc.).

Secure commissioning

New standardised Human Machine Interface (HMI) makes your life easier during commissioning. Plain text messages are displayed in your choice of language, giving you confidence in the settings you have selected. This HMI will be used in all future Endress+Hauser instrumentation.

Simple maintenance

With insignificant drift over time, the Coriolis technology requires much fewer calibrations and is subject to considerably less troubleshooting than your current device. The Promass E 200 includes event management functionalities that allow fast and secure interventions.

The embedded HistoROM ensures automatic data backup, avoiding the need to set up after exchanging the electronics. Designed from intermixable/ interchangeable parts, Promass E 200 contributes to spare parts stock reduction.

For further details contact Frans van den Berg of Endress+Hauser on TEL: 011 262 8000 or visit www.za.endress.com ■

RKC announces the new SA100L limit control with optional din rail mounting

RKC Instruments has introduced the new SA100L 16th DIN limit controller with an optional DIN rail mounting socket. The SA100L provides circuit protection in those processes with safety concerns or where product may be affected in am "over or under temperature" condition.

The SA100L is now available with an IP66 dustproof/waterproof front panel rating. The unit has a selectable high or low limit, peak ambient reading and an over-temperature hour meter. The SA100Lwill monitor the peak value and the amount of time the control remains over temperature and can be easily viewed by the operator from the front panel or via digital communication by a PLC or computer system. This information can be used to save product that might have been subjected to equipment overheat conditions.

The optional 11 pin octal socket allows for quick installation and easy mounting on a DIN rail or on to a pre-wired mating connector. The SA100L can also be panel mounted for viewing at the control panel. Maintenance is simple as the unit can be easily separated from the socket. Optional features include two independent alarms, analog retransmission output and digital RS-485 communications.

The versatility of the SA100L makes it suitable to both the end-user and OEM markets for applications that include plastic extrusions, blow moulding, ovens, furnaces, kilns, food baking, petro-chemical, test stands and heater processes.

For more information contact Temperature Controls on TEL: 011 791 6000 or email sales@tempcon.co.za ■

Isocure 372 & 672

Isocure 372 and 672 is the new Cold-Box binder systems from Applied Casting Solutions. This system provides the improved level of tensile strength that is needed for delicate, detailed cores and is relatively insensitive to sand type. Greater dimensional accuracy can be achieved as a result of higher immediate strength and improved early and long-term strength development. Look at the advantages -

Improved Strength

- Higher immediate strength
- Improved early and long-term strength development

Improved Efficiencies

- Reduced resin wipe-off on tooling
- Lower binder consumption

Improved Performance

- Greater bench life
- Better sand flowability and compaction
- Reduced scrap rates especially on thin walled cores

Applied Casting Solutions are your technical application specialists. We are dedicated to doing all we can to enhance the quality of your castings and give your foundry the competitive edge.

APPLIED™
Casting Solutions

giving you the edge

inherently AECI

Chem Systems

ASK CHEMICALS
We advance your casting

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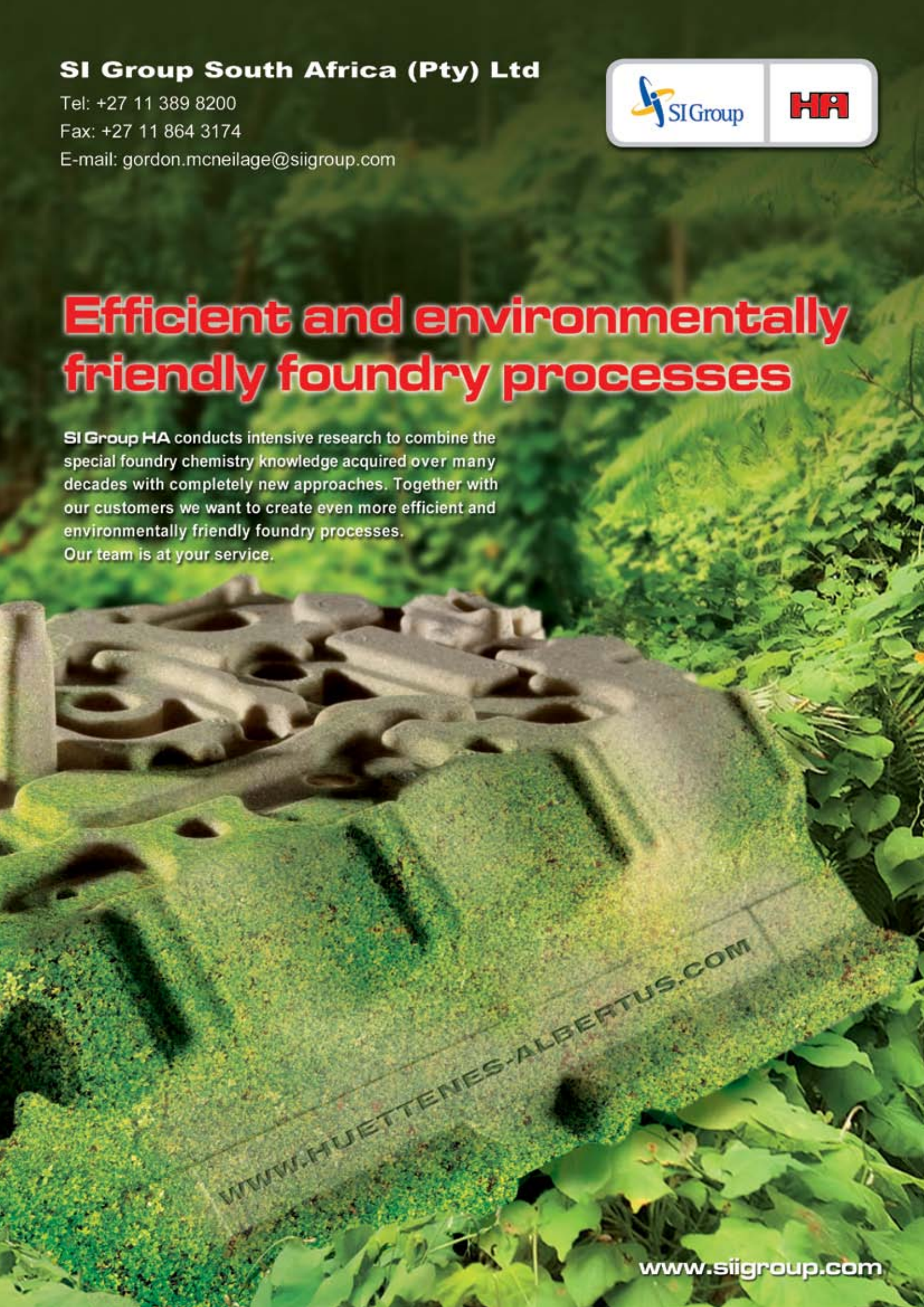
Email chemsystems@chemsystems.co.za Web www.chemsystems.co.za

SI Group South Africa (Pty) Ltd
Tel: +27 11 389 8200
Fax: +27 11 864 3174
E-mail: gordon.mcneilage@siigroup.com

Efficient and environmentally friendly foundry processes

SI Group HA conducts intensive research to combine the special foundry chemistry knowledge acquired over many decades with completely new approaches. Together with our customers we want to create even more efficient and environmentally friendly foundry processes.
Our team is at your service.



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