castings sa

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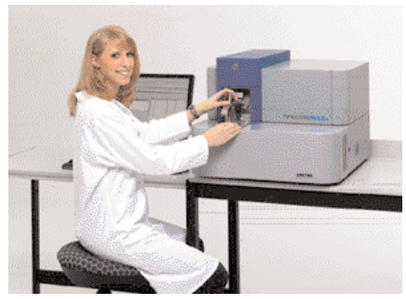

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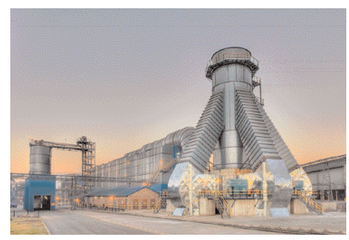

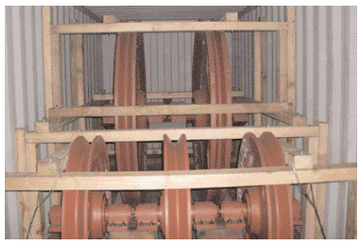

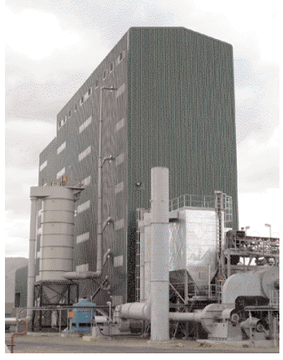

south african institute of foundrymen

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

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EDITOR'S COMMENT

As the utopia of the success of the World Cup recedes, reality sets in

I am proposing that we have a month long world cup every month of the year for the next 20 years minimum. As it is the most widely played and watched, the football world cup can be played every quarter and the other months can be taken up with additional high profile sports such as cricket, golf, rugby and tennis. And yes of course the only venue for these world cups must be in South Africa.

The resultant positives of this vision is that the infrastructure development in our country would be phenomenal, the friendliness and service levels would be the envy of the world, crime would be down drastically or at best reduced to petty levels, the tourists visiting the country and pumping in much needed revenue would be at an all time high, the unity of the nation would continue unabated and of course all those politicians and corrupt government officials would not be making the headlines because they would be too busy attending the games and matches at the splendid stadiums that they have helped to build.

During the world cup we have proved to the world that We Can Do It. But can we now demand the same performance from our public servants? Can we give a red card to corruption and profiteering through collusion, and to perennial non performers? Can we do the same to those who are slow to deliver on their promises; to those who fail to deliver?

As I write this column, barely a week after one of South Africa's greatest achievements we have reverted back into pre World Cup mode. Headlines that created so much tension and were non existent during the World Cup are now screaming out at us.

- Mystery surrounds UK couple found murdered
- Malema's back!
- ArcelorMittal rattles job saber
- Threat to steel supply sends shock wave across industry
- Power tariffs to large municipal users to surge in 2010/11

The euphoria of the World Cup has worn off very quickly and for our industry as a whole the implications in the war between Mittal Steel and Kumba, which has ratcheted up a few notches when talks stalled and the steelmaker immediately announced that it will close the Saldanha steel plant, stop exports and lose something like 4 000 jobs for the country, are very serious.

However when you have corrupt officials, corrupt politicians, who are undoubtedly implicated in the Mittal Steel/Kumba war as well as the self-enrichment of people in key sporting (and government) positions continuing unabated, the vision of hosting a World Cup every month for the next 20 years will never get off the ground.

It is no secret that pure greed and corruption always stems from the top down. As South Africans we need to collectively look at the source, implement changes and move on.

Dear Mr. Crawford,

In response to your article in the June 2010 issue, below is an article published in the New York Times, which I think very clearly shows the events in India.

I think that the readership of your fine magazine should also be brought up to date with events in South Africa. On the initiative of the Metal Recyclers Association (MRA) ten years ago, the Hazcom (Hazardous Committee) was formed, which includes representatives of the MRA, South African Iron and Steel Institute (SAISI), South African Institute of Foundrymen (SAIF) and the NFMIA (Non-Ferrous Metals Industry Association), as well as the National Recyclers Organisation (NRO) and the Recycling Association of South Africa (RASA), with the aim of identifying, removing and disposing of hazardous material, being radioactive, explosive and chemically contaminated metallic raw material for the recycling industry.

The committee meets four times a year and is also attended by representatives of the Department of Health (DoH), National Nuclear Regulator (NNR), SAPS Bomb Squad and Armscor. The committee also monitors any local incidents as well as keeps a register of all radiation-detecting equipment between the members of the various Associations. Hazcom is planning on holding a workshop on radiation later in 2010 for all the members of the Associations involved.

To date, we have had no major incidents such as India; however, it has recently been discovered that some prime stainless steel sheets were imported into South Africa and found to be radioactive. Unfortunately, to date neither the NNR nor the DoH has taken this matter up with the importer or supplier.

David Loewenthal - MRA Representative of Hazcom

NY Times reports that Indian University is deemed source of radiation exposure

The police have traced a major case of radiation exposure that killed one person and left six others hospitalized to a piece of outdated laboratory machinery auctioned off earlier this year by the chemistry department of one of India's most prestigious universities.

Deepak Pental, vice chancellor of the institution that was responsible, the University of Delhi, said at a news conference, "The university is very apologetic for what has happened."

He added, "The university takes a moral responsibility."

The disclosure represents a startling change in the official explanation of the case. The authorities had previously said that the radioactive materials appeared to have entered the country in a container of imported scrap metal. Officials at India's atomic regulatory agency discounted the likelihood that the source was domestic, and a government minister, speaking in Parliament, promised to tighten monitoring at ports that receive shipments of scrap materials.

Joint Commissioner Ajay Kashyap of the Delhi police confirmed that the radiation source was a "gamma irradiator" that had been kept in storage for roughly 25 years at the University of Delhi's chemistry labs. Commissioner Kashyap said the machine, which had been imported from Canada in 1968, was sold to a scrap dealer in February as part of an auction of unused equipment and other materials.

Commissioner Kashyap said the buyer took the machine to the Mayapuri industrial area, home to hundreds of tiny scrap shops, and dismantled it into smaller pieces, many of which were sold to another dealer named Deepak Jain. None of the workers or dealers in the scrap metal shops were aware that the machine contained cobalt-60, a radioactive isotope used in food irradiation and in radiotherapy for cancer treatment.

Mr. Jain and five others remain hospitalised, while one of Mr. Jain's employees died this week of multiple organ failure. The employee, named Rajender, often slept in a shop office and suffered the most exposure to the radiation, Commissioner Kashyap said. In early April, the police temporarily cordoned off part of Mayapuri as scientists removed radioactive materials.

Commissioner Kashyap said investigators were still inquiring into the details of the auction. Machinery using radioactive materials is supposed to be registered with the atomic regulatory agency, which has strict controls over domestically produced cobalt-60. But many experts have warned that older medical equipment, purchased in the 1970s and 1980s, often predates regulatory controls and can pose major public health risks if not properly disposed of.

“It was not realized that source may still be that strong,” he said. “We must learn from this incident.”

"Somewhere down the line, they should have realised this machine contained toxic materials," Commissioner Kashyap said in a telephone interview. He added, "At the time of disposal, perhaps this type of due diligence was not carried out."

Mr. Pental, the university administrator, said the machine was originally used in research conducted by a professor who long ago retired from the chemistry department. When the department decided to auction old machinery, Mr. Pental said a committee of professors overseeing the process included the gamma irradiator because they assumed it had outlived its radioactive life.

"It was not realized that source may still be that strong," he said. "We must learn from this incident."

Mr. Pental said the university would raise money to compensate the family of the man who died. ■

Ekurhuleni Metropolitan Municipality wants to close businesses with their new tariffs

Dear Bruce

Despite Ekurhuleni Metropolitan Municipality Executive Mayor Ntombi Mekgwe announcing in May that electricity tariffs were set to increase by only 28,9% we have received a notification that effectively hikes our bill in the region of 66%.

Since 2003 we have been charged a Tariff D rate, and based on our usage over the last year, if we stayed on the same Tariff D our bill will be rising from on average R100 047.00 a month to R133 583.00, which in itself is a 33% increase.

“As you know the new prices come into effect from 01 July and there is regrettably no time for negotiating on this.”

However Ekurhuleni Metropolitan Municipality have decided that if you use less than 1000 KVA a month you will be moved to a Tariff E rate and this means we will now have to pay R166 037.00 for our 800 KVA usage. These figures are calculated on low season rates so if we have to calculate them on the high season rate we will have to pay R235 687.00.

For a small business like ours it is going to make it difficult and will definitely have a snowball affect on casting prices which inevitably will skyrocket over the next three years. We had already notified our customers that they could expect a 25% increase purely because of the electricity price increase, but now we are going to have to advise them that we are going to withdraw that percentage increase and re calculate as we have been advised by one of our suppliers who sent us the following letter:

"We could only get hold of the new Ekurhuleni Metropolitan Council's electricity tariffs yesterday, 24 June 2010. According to this schedule, and confirmed with Mr Johan Dreyer, Senior Engineer for the Alberton region, we are without choice or consultation shunted from Tariff D to Tariff E. This means that our effective price increase for electricity is not at 31% announced by Eskom, but probably about 52% because of this category shift by Ekurhuleni Council. See enclosed spreadsheet indicating our options - 70.7c / kwh after the Eskom increase to a choice of between 86.6c / kwh on Tariff E or 88.0c / kwh on Tariff C."

"We are obviously doing everything we can and have been trying for two days now to arrange an appointment with Ekurhuleni officials, at Director level, to investigate this matter and to try to reverse it, despite the fact that the tariff schedule is very clear about the 52% matter and really holds no hope of successful appeal."

"There was no way in which we could have foreseen this and we cannot handle this additional price increase in the current costing of your product. This means that whatever costing, forecasting or quotations we have supplied you with becomes null and void with immediate effect. A new costing with a different pricing structure will be sent to you for implementation on 01 July 2010."

"As you know the new prices come into effect from 01 July and there is regrettably no time for negotiating on this matter as we were not afforded the luxury of time by Ekurhuleni. Needless to say I will keep you informed, literally on a daily basis, on my success or lack thereof with the negotiations with Ekurhuleni on this matter. If we are successful in negotiating a lower increase, we will adjust our costing downwards."

Bruce, like our supplier we have been forced to move to Tariff E without any consultation. In this time when we are being urged and encouraged to use less electricity we are being penalised when we do so. If we do our calculations we might as well use the extra 200 KVA a month on keeping our factory warm during winter or cool during summer to get the preferential rate and we will end up paying the same as we are scheduled to now. If we take this route at least we will have happy staff!!!

Who gave Ekurhuleni the right to just do whatever they like and have lavish functions announcing these new tariffs while we must suffer and take the losses?

Name withheld due to sensitivity of the letter ■

New SPECTROMAXx

SPECTRO'S bestseller is now more economical and more flexible.

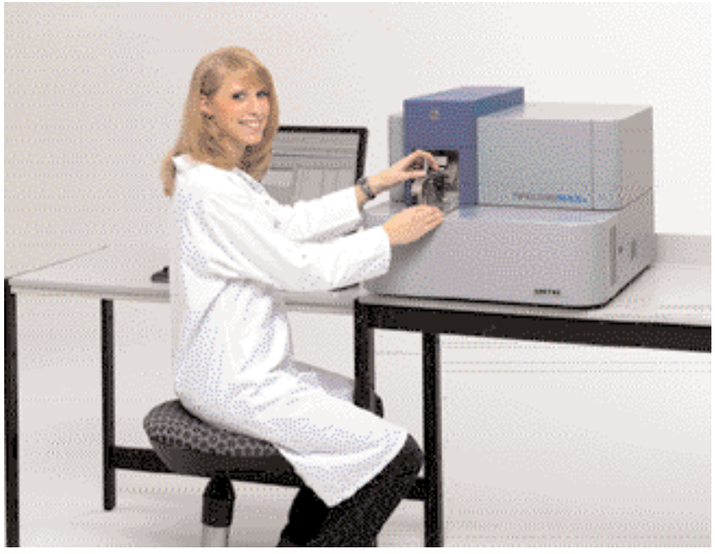
- Stationary metal analyzer with CCD technology now in its fifth generation
- New model with greatly reduced argon consumption, integrated diagnostic and improved small sample analysis

SPECTRO Analytical Instruments presented the newest generation of the SPECTROMAXx stationary metal analyzer at the CONTROL trade show in May 2009 in Stuttgart, Germany. The CCD-based analytical instrument was the most successful SPECTRO model over the last few years: Approximately 3,500 instruments have been sold since the beginning of 2005. The current generation of the top seller offers many improvements: The most important innovations are an argon saving module that clearly reduces the argon consumption and a new package of methods and adapters for small sample analysis.

"The SPECTROMAXx has established itself as the international standard for stationary metal analyzers," explains Tom Milner, head of marketing at SPECTRO. "But even such a top performer can be improved. The fifth generation is more economical, more flexible and more user-friendly than its predecessor. We've raised the bar a good bit higher."

New argon saving module

The highlight of the current product generation is the new argon saving module that reduces the argon consumption when the instrument is not in use to zero, leading to substantial savings. Product Manager Kay Toedter explains how it works: "When the spark generator is turned off at the end of the day, the argon saver shuts the flush down to zero. The operator sets the time when



the instrument is to be used the next morning. The system then automatically starts up the instrument so that the spark stand and the optical system are optimally supplied with argon, on time for the first measurement of the morning." When idle for a longer period of time, e.g., on the weekend or during works holidays, the instrument is also completely shut down, enabling a proportionally higher savings. The instrument can also be pre-programmed for this type of interruption over several days so that the optic is already flushed and ready to measure punctually when work begins.

Improved analysis of small parts

Small sample analysis has also been improved for the SPECTROMAXx: Pre-defined method packages for small pieces of iron, aluminium and copper matrices in the form of screws, pins, wires and sheets are now available. The method packages cover all standard applications in small part analysis. At the same time, SPECTRO offers a new set of adapters for the new SPECTROMAXx, ensuring simple handling of small samples in the laboratory: With the special adapters, small parts and wires can be precisely and securely fixed over the measuring aperture. The adapters accelerate sample throughput in the laboratory and guarantee reliable and reproducible results for measurement series.

New diagnosis system

Important from the maintenance standpoint: The new SPECTROMAXx possesses an integrated diagnosis system, which continuously informs operators and service technicians as to the state of the system and all of its

SPECTRO is one of the worldwide leading suppliers of analytical instruments for optical emission and X-ray fluorescence spectrometry

main components. This makes it possible to more quickly rectify malfunctions and favorably complete service calls. The internal components of the SPECTROMAXx have been rearranged for optimal serviceability. It is no longer necessary to remove any blocking components in order to conduct common maintenance processes such as changing filters or replacing the filter cartridge. The UV lens can be externally cleaned and replaced.

In addition to the new arrangement of the hardware, the SPECTROMAXx now uses the "Spark Analyzer Vision Software" already proven in the larger SPECTROLAB systems.

About SPECTRO

SPECTRO is one of the worldwide leading suppliers of analytical instruments for optical emission and X-ray fluorescence spectrometry. SPECTRO manufactures advanced instruments, develops the best solutions for strongly varying applications and provides exemplary customer service. SPECTRO's products are exemplified by unique technical capabilities that deliver measureable benefits to the customer. From its foundation in 1979 until today, more than 30,000 analytical instruments have been delivered to customers around the world.

AMETEK, Inc. is a leading global manufacturer of electronic instruments and electric motors with an annual turnover of approximately 2.5 billion USD. AMETEK's corporate growth plan is based on four key strategies: Operative excellence, strategic acquisitions and alliances, geographic and market expansion as well as new products. AMETEK's common stock is a component of the S&P MidCap 400 Index and the Russell 1000 Index.

For more information contact Spectro Analytical Instruments on TEL: 011 979 4241 or visit www.spectro.com ■

Vestcast expands equipment and client base

Company re awarded ISO 9001:2008 certification in May 2010.

Since its establishment nine years ago, Vestcast has grown rapidly to become one of the most prominent foundries in South Africa. Vestcast supply investment castings to the mining, automotive, pump and valve, medical, armaments and general engineering industries, specialising in air-melted alloys.

Vestcast is located within the Gauteng province, the hub of South Africa's manufacturing industry, just three kilometres from OR Tambo International Airport and thus ensuring complete convenience of service to the customer and the supplier.

This ISO accredited company is not only in a position to supply sound investment castings but can also provide clients with design inputs such as, selection of the correct materials, practical solutions, machining of castings, analysis of unknown metals with a spectrometer, metallurgical services and many more. Vestcast is built upon an extremely dedicated and capable management team which is supported by a world class manufacturing facility and a highly skilled workforce.

The second new Gifo double head wax injection press that can handle dies up to 500 mm wide

Vestcast supply investment castings, also known as lost wax or precision casting in all commercially available alloys including aluminium, brass, bronze carbon steel, all stainless steels, cobalt as well as nickel based alloys. The company operates both gas fired melting furnaces as well as induction melting units. They produce small and large quantities in weights from a few grams up to 18 kilograms.

As the youngest commercial investment foundry in South Africa, Vestcast has seen rapid growth since its inception and in particular over the last three years. In order to meet demand they have had to invest in equipment, people and systems.

The investments in new equipment started in 2006 with the installation a new double head injection wax press, a Rotoblast shotblast machine and a new sand blast machine. Capacity was further increased when the company purchased all of the foundry equipment of the defunct KwaZulu Natal investment casting foundry - Sabex Manufacturing. The equipment includes melting furnaces, dipping and wax tanks, cleaning and finishing equipment, wax presses, a boiler as well as a dip room conveyor system.

This was followed by investment in another new double head wax press as well as more shot blast and aluminium oxide blasting machines. In so doing the company had increased its capacity by 40% at the time.

The shotblast equipment was purchased to supplement the company's water blasting equipment, which they have been using since the inception of the company, because different applications call for different types of cleaning.

Now the company has installed a further two new double head wax presses, a 250 kilowatt induction melter and another boiler clave. This should increase the company's capacity by a further 60%.

In June 2003 Vestcast was awarded its ISO 9001:2000 system, which they do not view simply as a quality system, but rather as a total management system. They subsequently had yearly audits and were re awarded the certificate with no observations or findings. This has been further enhanced with the repeat audit of ISO 9001:2008 by TüV Reinland in May 2010.

In 2003 Vestcast also started exploring the export market and exhibited on the South African Pavilion at GIFA 2003. The company has continued to go down this avenue and participated in the Foundry, Furnaces and Castings Expo 2006 in Harrowgate, UK, which formed part of the World Foundry Congress, and participated on the South African national pavilion at NEWCAST 2007, which took place in Düsseldorf, Germany in June 2007.

Plans are afoot to exhibit at NEWCAST 2011 next year which will take place again in Germany.

The resultant exposure has meant that today the company is exporting directly to Germany, Austria and the Middle East.

Another achievement in the company's history is the ability to cast in SG iron. Not many investment casting companies in the world can do this type of casting.

Vestcast tooling and machining

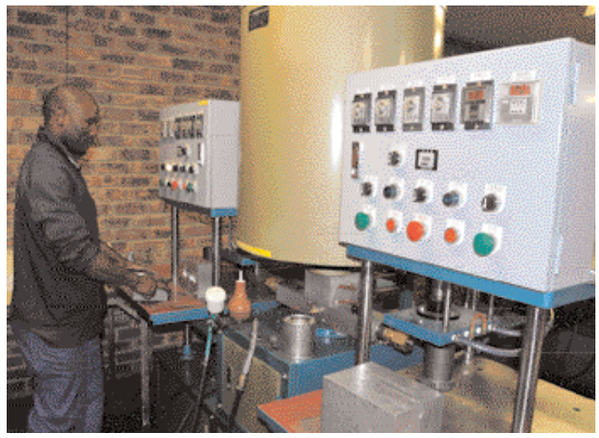
In 2007 Vestcast added an additional service that they can offer their clients by investing in a fully equipped tool room. The facility came on stream in July that year and initially offered a die and mould manufacturing service, as well as being able to do small machining runs.

"We needed to have the flexibility of offering our clients the opportunity to have the complete product manufactured by ourselves - from design to finished item."

The equipment in the tool room consists of a Haas TM 2 CNC tool room mill, a Lilian CNC milling machine, an Akira-Seiki SR3 CNC tool room mill, a spark eroder and a Standard conventional lathe with a swing of 500 mm.

Added to the shopfloor within the last six months has been a new Doosan Infracore Puma 240 CNC lathe, supplied by Puma Machine Tools to increase machining capabilities.

The staff compliment has reached 68 with Directors Dave Barnes and Fanie Fouche heading up the company. Dave's son Dwayne joined the company in 2007 and after



One of the new Gifo double head wax injection presses

intensive training now looks after the tool room. Dave's other son, David (Jnr.) has also joined the company as Sales and Marketing Manager and filled the huge gap left by the sudden passing on of two Directors, David Fourie in 2007 and the company's former MD Johan la Grange in October 2008.

The company is now back up to full production working 24 hours, seven days a week.

The future of Vestcast certainly looks very bright at this stage with more expansions in the pipeline. The good name of the company and the high levels of service provided will ensure that Vestcast continues to grow as an investment casting company, now able to offering a turnkey facility to their clients.

For further details contact Vestcast on TEL: 011 397 4564 or visit www.vestcast.co.za ■

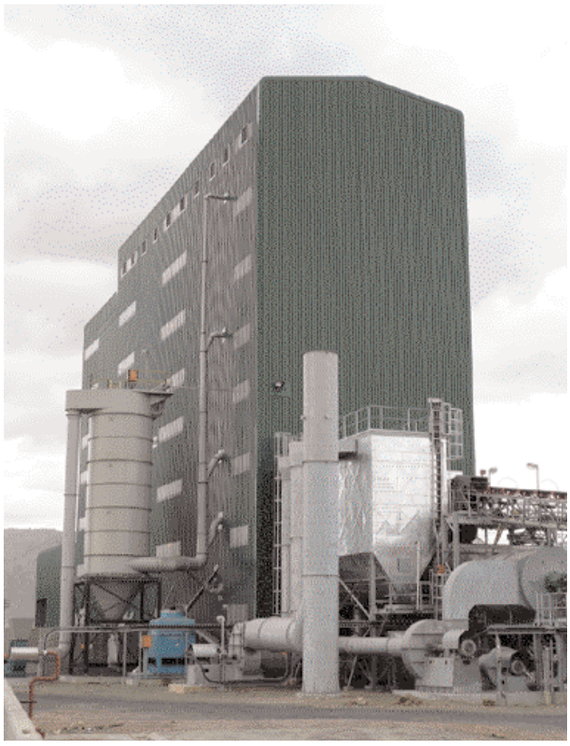
AMCOL International Corp. invests $50 million in a plant dedicated to producing foundry chromite sand, just outside Rustenburg

New manufacturing process (patent pending) to produce foundry chromite sand that has little or no fines and impurities (very low silicates), which can be supplied to any desired customers grain size distribution.

New York Stock Exchange listed AMCOL International Corp., a leading international producer and marketer of value-added, specialty minerals and related products has invested $ 50 million (R 375 million) in a plant dedicated to producing Hevi-Sand® (foundry chromite sand) as a primary source, just outside Rustenburg, North West Province.

"Up until now foundry chromite sand has been produced as a by-product of the ferro-chrome industry" said Roy Aune, Managing Director of Volclay South Africa, "Whereas, AMCOL International Corp. has no ferro chrome interests and has set up this operation to mine, manufacture and market the new source of foundry chromite sand worldwide."

"This left the foundry industry very dependant on the ferro-chrome industry's needs with supply, quality and pricing being extremely variable" continued Roy.



The seven storey building housing the dry separation plant with the sand drying and baghouse in foreground

"The open-cast mining operation that we have set up is unique in that it is the first of its kind in the world, that we know of, whereby we will be mining the chrome ore to manufacture only foundry chromite sand, as well as implementing a new and exciting process to convert the ore into high quality foundry chromite sand. The new process to manufacture the foundry chromite sand has been developed because Amcol needed to solve their supply and raw material quality problems. The process is currently being patented worldwide and will be unique to Amcol" explained Roy.

"The resultant scenario is that we will be able to supply on demand, as well as provide a quality product that has a high chrome content, little or no fines or impurities (low silicates) and a specification that the foundries are constantly looking for but are not consistently able to obtain with the current supply."

Stable pricing, consistent supply and reliability

"The mine that we have acquired has two seams with an approximate 15 to 20 million tons of ore available to be processed."

"The plant will initially process 30 tons an hour but has been designed to process up to 100 tons per hour and can be expanded when necessary. With this amount of tonnage available foundries will be able to order when required and will not have to stockpile. More importantly the consistent supply of product to order specification, will allow foundries to continue with production with little fear of product variability" explained Roy.

"Because the manufacture of foundry chromite sand is our primary business, we will offer contract pricing rather than the current quarterly changes, bringing the industry, the additional advantage of stable medium term pricing."

Local participation

"When we purchased the deposit from an Australian company we made a commitment to involve the local communities and they are now becoming our partners in the mine through the new BBBEE company we are creating. We have provided employment and training as well as numerous other participation schemes and trusts that are benefiting the community. The Department of Minerals and Energy has been involved from the beginning and we have all the necessary permits and licences in place."

"The deposit we are working previously had a smelter located on it. As a result the infrastructure such as power

The weighing and bagging station with Roy Aune, Joe Howden and Arrie Schriek. Joe Howden has been the principal developer of the Hevi-Sand® Process and he will be presenting a paper at a SAIF technical evening on the 29th September 2010

The Blatlhako mine near Rustenburg with the Hevi-Sand® plant in the background

and tarred roads was already in place which not only made the project feasible but also allowed us to accelerate the time frame to get the product to market."

"All our tests have shown that we have a far superior product compared to what is currently being supplied and going forward we and our foundry clients will not have to rely solely on the ferro-chrome industry for supply."

"We have appointed Arrie Schriek as our Technical Sales representative for the South Africa region. Arrie has 40 years experience in the foundry industry, at Dorbyl and SARCO, and will provide on site technical service and advice to our customers. Volclay International, a subsidiary of AMCOL International Corp, will control international sales."

The Hevi-Sand® Process

Foundry grade chromite sand production methods and acceptance specifications have changed little in the last 50 years. This article reviews the old, the existing, and the new "Hevi-Sand® Process" used to produce foundry chromite sand. The advent of new mining and processing technology , coupled with changes over the years in foundry practices and procedures, suggests that new and standardised criteria for specifying and testing of Hevi-Sand® processes products (foundry chromite sands), is long over due.

The vast majority of chromite sand used in foundries comes from South Africa. While there are large chrome ore deposits in other regions, the type of formation, crystal size and impurities result, in most instances, in undesirable foundry properties. The rest of this article therefore only considers foundry chromite sands from South Africa.

Historically and up until 2008, most of the mining has been carried out by large mining houses that are either producing ferro-chrome or servicing ferro-chrome producers. Foundry sand has always been very much a by-product business i.e. less than 3% of the mined production ends up as foundry sand.

Typically from 100 tons of mined ore, 33 tons would be lumpy 44%Cr203, 33 tons small lumpy 42%Cr203, and 33 tons fines 35%Cr203. The lumps are fed straight to the smelter for conversion into ferro- chrome, leaving the fines as a problem product due to its low chrome content and high silicates contents. This material is processed via "Humphrey spirals" to wash and concentrate it into a useable product. (Humphrey spirals were developed in the USA during the Second World War).

This concentration usually results in three or four streams of product dependent on the configuration of the plant. For the 33 tons going into the plant, typically you would get 18 tons of Met-grade 42% chrome, nine tons Chem.-grade, three tons foundry grade and six tons of waste.

Spiral plants work well with consistent feedstock, and work essentially by pumping a slurry (water and chrome ore) to the top of spiral towers from where it runs down through the spirals and is concentrated based on particle mass / velocity by means of weirs and diverters. It is effectively mechanised panning for gold.

There are a number of obvious drawbacks with this system; variations in feedstock, slurry density, pump pressure, agglomerated fines, etc all make control very difficult. It also requires large quantities of clean water, in what is a very

arid area of South Africa resulting in the need to recycle as much water as possible. When all these variables are added together, the result is variable product quality.

A new technology, a new idea

In the summer of 2004, price and availability of foundry chromite was becoming an issue. The commodity boom started to create a ferro-chrome shortage and therefore most of the large mining houses concentrated on converting as much chrome ore to ferro-chrome as possible, to avoid letting down their core business, i.e. steel making, which in turn reduced availability and often the quality of foundry sand, which in turn pushed prices up.

Amcol as a long term supplier to the foundry industry decided therefore, to investigate how they could solve their supply and raw material quality problems. As Amcol progressed they realised that because of history, concentration on core market, internal expertise and pressure, that none of the existing suppliers had a mining operation which focused solely on foundry sand. Indeed the foundry sand being produced was as a result of a need to add some value to the fines which are produced during mining for their ferro-chrome operations. Amcol decided therefore that they would concentrate only on foundry sand and at the same time try to develop a technology which maximised foundry yield, reduced waste and reduced the environmental impact of the process, while removing as many variables as possible from the process, resulting in a product which could be tailor made to improve overall foundry sand and casting quality.

Through a mixture of their own internal laboratory, external laboratory work, and some of the leading processing companies in the world, Amcol came to understand the process requirements and the limitations of the existing spiral techniques. Amcol concluded that with the right ore body, good liberation, and high technology separation, they could convert in excess of 65% of the mined ore body into very consistent high quality foundry sand, while at the same time reducing water consumption by at least 70%.

The company found that in the assay of crushed unwashed lumpy ore the majority of the contaminates (silicates) are held either within agglomerates i.e. particles above 600 micron or as fines.

They therefore concluded that crushing and sizing along with liberation must be controlled to maximise yield. When they looked at existing plants, most producers were using either ball or rod mills to bring their spirals plant fines feed to grain size. The problem with this approach is that it is akin to taking a sledge hammer to crack a nut and while reasonably effective at getting down to grain size and liberation levels, it also damaged a lot of crystals and resulted in a lot of waste fines, in some cases in excess of 35% of the feed, where as the calculable waste should be less than 10%.

After much discussion and trial work with various mill manufacturers Amcol eventually acquired equipment from a USA manufacturer which could achieve impact liberation and sizing with little chrome crystal damage.

Having achieved a significant improvement in liberation they then considered how to reduce water consumption and avoid the control difficulties surrounding the operation of conventional spiral plants. After many trials and brain storming sessions the company decided to concentrate on a wash process followed by dry separation.

The work resulted in the company utilising a mixture of fluidization, air classification, rare earth magnets and electrostatic separation and grain size classification.
By combining these technologies they managed to achieve an 85% yield of saleable product through the process, which also allowed them to produce multiple Hevi-Sand® sizes without increasing impurities.

As they have refined the process they are now producing product which typically contains fewer impurities i.e. assaying typically >47% Cr and <0.6SiO2, and which also classifies sand grains allowing blending to produce any sieve distribution, a foundry is likely to require. Furthermore, environmentally the process results in 70% reductions in water consumption and waste, along with a 50% reduction in power, when compared to the traditional spiral plant.

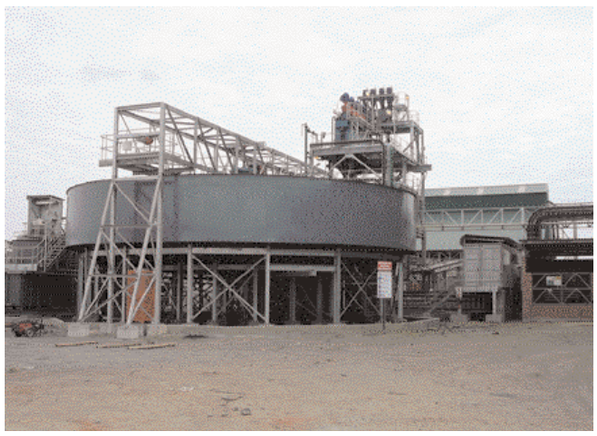
Given the above it drove the company to try and understand more clearly how supply, time and foundries practical experience had driven their understanding of and how they defined good or bad chromite sand.

Why do foundries use chromite sand?

Chromite sand has a number of interesting properties useful to foundries:

1. Improved heat-transfer characteristics
2. Heat abstraction on large castings in particular quality can be significantly improved if as the mould is filled a solidifying skin is created as the metal rises up the mould face. The high heat abstraction rate increases the thickness of the solidified skin reducing the risk of it being washed away allowing faster filling times. This high heat abstraction rate also aids in inhibiting penetration and burn on defects

The dry plant showing part of the sand dryer, fluidised bed and dust extractor



The wet separation plant

3. High fusion point 1850c, making in particular, core removal easier and improving cleanliness of feeder necks reducing the risk of the cutting flame being deflected into the casting
4. It is chemically basic PH 6.5-7.5 making it less prone to being wetted by steel, and slag reactions, when coupled with points 1-2-3 reducing penetration and burn on defects
5. It does not react with manganese steels as does silica sand
6. It has high permeability and when properly vented reduces core temperatures and gas defects
7. It is reclaimable.

Foundry problems with current supply

Most of the chromite sand used in foundries is used in conjunction with resin binder systems. Many of these systems rely on high efficiency mixers with low additions levels, typically; resin 0.8% plus an acid catalyst 0.125%. Therefore small variations in sand quality can have a significant effect on these small additions and on the resultant moulding sand properties.

1. Changes in acid demand / PH caused by poor water quality during processing or high levels of alkaline impurities (silicates) can cause the resin not to harden properly, or too late, or too soon (if the sand quality improves over the norm)
2. Changes in turbidity as above, but also increased incidence of double skin defects
3. Dust and segregation caused by packaging, storage silo design, incomplete liberation, results in nuisance dust, variable sand curing times, and increased resin requirements.

The problems above can increase resin costs, result in moulds being scrapped, or add excessive time to the fettling and inspection time of large castings.

It is therefore no surprise that foundries take chromite sand quality seriously, and test and specify some or all of the following parameters:

1. Chemical Analysis
2. Acid Demand at PH 5, PH 4, PH 3
3. PH
4. Turbidity
5. Loss on Ignition
6. AFS number
7. Sieve analysis distribution
8. Fines

In order to decide on what properties truly matter to

foundries it is important to consider the effects of each of the test parameters and the practical disadvantages of deviation from the results. Therefore in reviewing these effects one must consider what foundries are trying to achieve by using chrome sand:

1. Rapid Heat abstraction rate
2. Good permeability reducing gas pressures and overheating
3. Low thermal expansion, dimensional stability, no veining
4. High resistance to penetration and burn on, improved surface finish
5. Lower binder and catalyst additions and thus lower gas evolution

The Hevi-Sand® Process project and the associated research and testing have thrown up a number of issues with regard to the supply and procurement process which currently exists in the industry:

1. There is no definitive or agreed world standard specification for foundry quality chromite sand
2. Test procedures and technical requirements are often inconsistent or based on habit / past experience or in many instances based on information and products which were defined 50 years ago
3. There are significant benefits to be gained by maximising bulk density as long as permeability and resin additions are controlled.

Amcol hopes that the information and the arguments they have concluded in their research can be used by the industry as the validity and the basis for the industry and its technical institutions to review recommended acceptance specifications.

They believe that there should be the minimum requirements, while as a supplier they can also make suggestions for product enhancement. Their recommended test procedures are available for scrutiny and should you wish to see the detailed studies please contact Amcol.

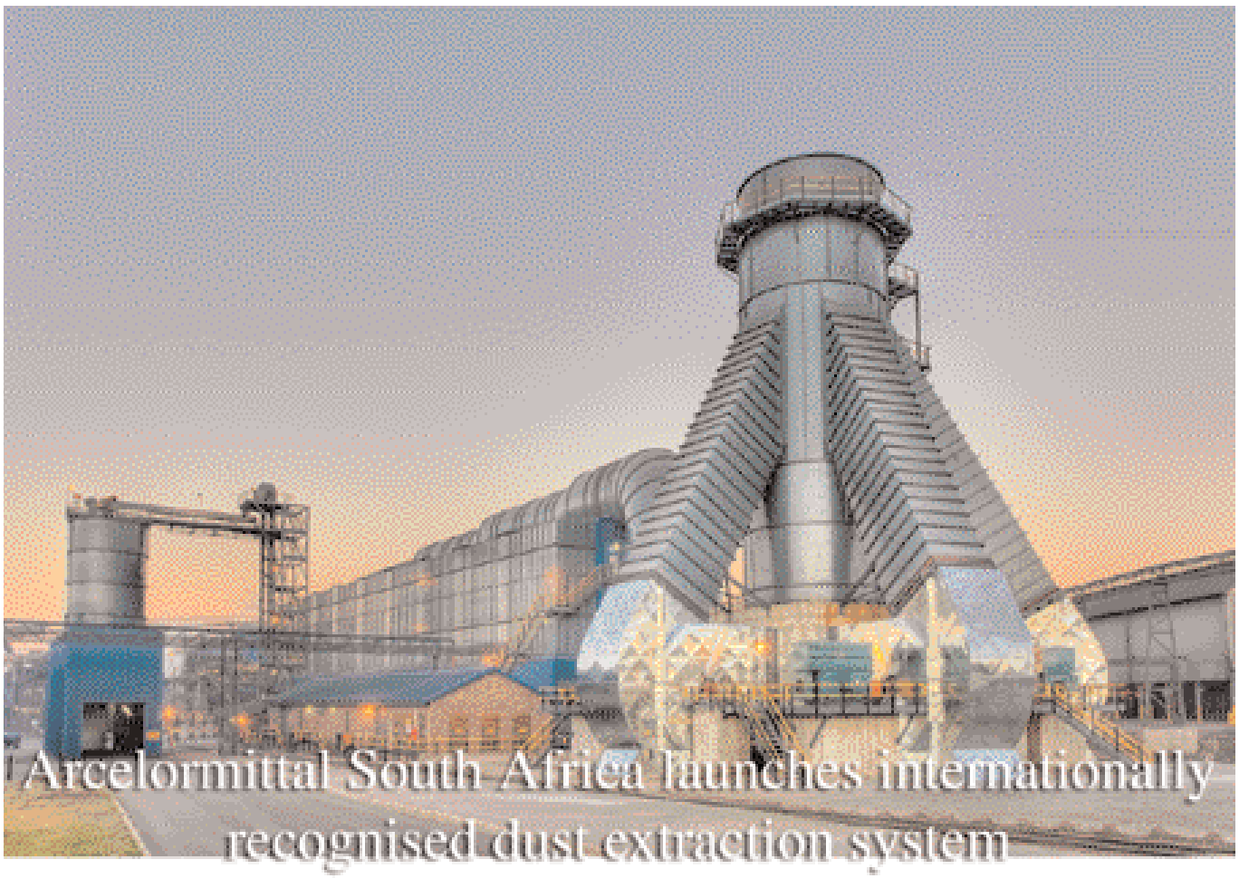
About Amcol International Corp.

AMCOL operates four primary segments: Minerals & Materials, Environmental, Oilfield Services and Transportation, providing a diverse range of products and services. Major markets served include metalcasting, detergents, pet products, building materials and personal care. AMCOL's transportation segment acts as a servicing operation for other business segments and outside customers.

AMCOL's long history of bentonite experience, exceptional staffing and world class R&D facilities continues to introduce innovative products and services into the marketplace. A leader in bentonite technology, AMCOL's long-lived core product lines have attained leading brand recognition.

Headquartered in Hoffman Estates, IL, US AMCOL operates facilities in Asia, Australia, Europe, North America and now Africa. Established in 1927 the company employs 2000+ employees worldwide.

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



Arcelormittal South Africa launches internationally recognised dust extraction system

ArcelorMittal South Africa officially launched a R220 million dust emission control system located at the Vereeniging plant in June, which is the first of its kind in South Africa and is considered a benchmark for future steel plants internationally.

ArcelorMittal South Africa Chief Executive, Ms Nonkululeko Nyembezi-Heita commented: "This is one of the most significant environmental projects undertaken by ArcelorMittal South Africa in recent years and I am very pleased to say that it has eliminated an almost permanent dust cloud above our Vereeniging steel works".

Ms Nyembezi-Heita, said: "Today marks an important milestone in our quest to attain full compliance with environmental legislation and address some of the findings arising from the Green Scorpions' 2007 inspection of Vereeniging".

A detailed study was conducted to benchmark various dust control solutions around the world, which included plants in Germany, Greece, Poland, and Spain, and a project was then initiated focusing on decreasing primary and secondary missions from the Vereeniging site.

The dust extraction system, which is largely aimed at capturing primary dust emanating from the electric arc furnace, consists of a new roof design for the ladle furnaces to enable more efficient capture of fumes. While dust loading into the alloy feed system was not identified as contributing to the emission problem, the company included it in the project as it was becoming a nuisance factor to workers. The existing radiant cooler was also replaced with a high temperature quenching system to cool down the hot gas from the primary suction at the electric arc furnace.

Ms Nyembezi-Heita added: "We are really pleased with the progress we've made towards meeting our environmental obligations, in particular, tackling deficiencies in the areas identified by the Green Scorpions. Various interventions are currently being implemented while others are at an advanced planning stage, to address concerns around the furnace's dust, black and white slag, and the removal of magnetite from affected sites. We are investing almost R1 billion between 2008 and 2011, which includes this dust extraction system. In addition, we have set specific targets to reduce CO2 emissions by 8% per tonne of steel produced by 2020 in line with our parent group."

Two specialised contracting companies were used as technology partners for the project, namely: Howden and Badische Stahl Engineering. When the project commenced, it soon became clear that the existing bag house filter capacity would not be sufficient for the new system and a new filter with almost ten times the capacity of the old filter was installed instead.

Ms Nyembezi-Heita concluded: "The project was completed on schedule and within budget. Not only will the dust emission unit ensure the sustainability of this plant, but it is already contributing significantly to cleaner air within the Vaal Triangle area, and having a positive impact on the lives of our neighbours". ■

The dust extraction system, which is largely aimed at capturing primary dust emanating from the electric arc furnace, consists of a new roof design for the ladle furnaces to enable more efficient capture of fumes

Copalcor installs Inductotherm VIP® Induction Power Supply unit

Several plant upgrades to increase company's capacity and production.

Copper, brass and alloys converter and manufacturer Copalcor has recently installed a state-of-the-art 1000 kW Inductotherm VIP® Induction Power Supply unit that will increase its melting capacity in the non ferrous foundry division of the company.

The Inductotherm power supply unit that Copalcor has installed will supply power for the melting of commercial brass and copper alloys in an existing three ton furnace. The furnace is used by the company to supply metal for a continuous vertical casting process. The metal is cast into rounds and a flying saw procedure is used to cut the billets to size in seven and nine inch diameter. These billets are then extruded into coil form, drawn through a die for final size, cut-to-length and then packed for the international welding industry.

The new power supply unit has been installed in the non ferrous foundry division of Copalcor and is being used to melt commercial brass and copper alloys in an existing three ton furnace

The existing 1000 kW Inductotherm power supply unit will be stripped, refurbished and upgraded and then installed to compliment the new power supply unit. Once all three furnaces located in this division of the company are fully functional the company will have the capacity to melt over 400 tons of non ferrous metal alloys a month.

"I have been with the company for over 18 years and this is the first new power supply unit that the company has installed in that period" said the company's Engineering Manager Barney Barnard.

"The installation of this Inductotherm power supply unit represents a milestone in our company in that it is the first unit that has been installed in South Africa that was fully manufactured by Inductotherm's wholly owned manufacturing facility in India" said Cerefco (Pty) Ltd's Managing Director Scott Mellville, the company that represents the Inductotherm Group in Southern Africa.

The installation of the new power supply unit took place in June.

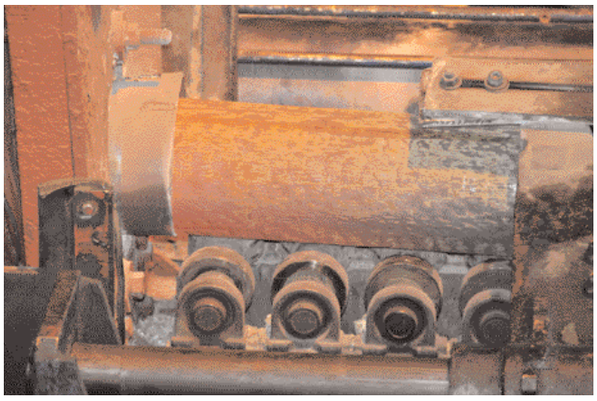
The new 1000 kW Inductotherm VIP® Induction Power Supply unit

Further plant investment

Cerefco has won another order from Copalcor which will involve the installation of a 1600 kW induction heating system for both sawn and sheared brass and copper alloy billets. The billets are heated via a coil to 850º C before being transported by means of the existing mechanical handling system, which will be modified and upgraded to suit the new heater, to an extrusion machine that will be located next to the new billet heater.

The new Banyard heater has been manufactured by Inductotherm Heating & Welding Technologies in the UK.

The billet heater is due for installation in September and in anticipation of the arrival of the new equipment Copalcor has also upgraded the extrusion machine,



A billet that has been heated via a coil to 850° C on one of the existing billet heaters which will be replaced by a new Banyard heater in September

The heated billet entering the extrusion process

including the hydraulics.

Designed to heat 35 billets an hour, the new machine will replace two existing lines.

Banyard specialises in non-ferrous induction heating technology providing mains and low frequency heating solutions for aluminium, brass, copper and exotic alloys for both sawn and sheared billets.

Copalcor offers solutions incorporating a wide range of rolled, extruded and forged non-ferrous metal products for the local and international market.

Copalcor is one of South Africa's largest manufacturers and suppliers of copper, brass and alloys in any shape, size or form. The Copalcor Group offers clients a complete solution from design to manufacture, through to installation. Solutions can be tailor-made to suit client specifications, and technological developments in the industry are closely monitored and where necessary, implemented.

Products on offer include busbar and bustube, hanger bar, copper mould plate and cooling blocks, earthing products, brazing rod, profiles and custom extrusions, copper and brass rolled products, forgings, copper and brass foil, strip, disks, plate and sheets, copper and brass extruded products, roofing copper and ingots.

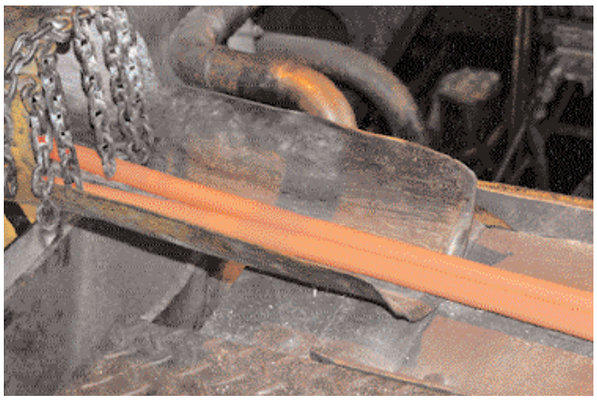
Effective project control is facilitated by having most manufacturing operations centralised at Copalcor's production facilities, situated on a 40 hectare company-owned property in Wadeville, Gauteng. The company has a well-established network of local and international sub-contractors and suppliers who can supply any specialised components and materials.

Copalcor is also experienced in the design and supply of all steelwork and insulation material for supporting busbar systems, and has extensive experience in managing the shipment and installation of busbar systems worldwide, including the provision of all installation manuals and drawings.

Copalcor has implemented turnkey solutions for chemical corporations, electroplating copper foil plants, mining and mineral beneficiation companies, and companies in the metals furnace and smelting industries amongst others.

Cerefco (Pty) Ltd, the official representative of Inductotherm Corp. USA, maintains a large inventory of Inductotherm spares and they service and supply parts to their existing user base of over 130 Inductotherm power units and furnaces. Their clients in Southern Africa use the whole range of Inductotherm equipment from 25 kW up to 12,000 kW, the first Inductotherm unit being sold in South Africa in 1960.

For more information regarding Copalcor's products, solutions or events, please contact them on TEL: 011 821 0700 or visit the website at www.copalcor.co.za. For more information on the Inductotherm equipment contact Cerefco on TEL: 011 845 3253 or visit www.cerefco.co.za. ■



Extruded round bar

The new 1600 kW induction heater that will be installed in September

Palamin, IMBS and IDC explore low cost iron-making opportunity in Phalaborwa

A collaboration has been announced between Palabora Mining Company (Palamin), the Industrial Development Corporation of South Africa (IDC) and technology development company, Iron Mineral Beneficiation Services (IMBS) to explore the establishment of an iron-making facility in Phalaborwa.

The parties have entered into a framework agreement whereby IMBS technology will be used to beneficiate Palamin's magnetite reserves.

"While continuing to investigate all options to extend the copper operation at the Phalaborwa site, Palamin has been investigating opportunities around the company's 240 million ton magnetite stockpile as a means to extend the life of the mine," said Palamin managing director, Matt Gili.

IMBS has developed the Finesmelt™ technology, which allows the reduction of super-fine iron ore to a highly metallised iron product. This product can be briquetted as a feedstock for electric steel-making or can be further beneficiated by melting to produce steel products.

Gili said a number of synergies could be explored with IMBS. "These include brown-field site establishment and diversification within the existing Phalaborwa Industrial Complex. This long-term project will not only lead to significant job creation opportunities but will also have the environmental benefit of removing the substantial magnetite stockpile."

IMBS chief executive officer John Beachy Head said he is excited about the venture. "The IMBS technology has evolved to a stage where the next step is the establishment of a commercial-sized production unit," he said. "We have conducted considerable test work and analysis on various site options, both internally and with specialist advisors, and an operation at the Phalaborwa site is a logical choice. Our technology is imminently suited to the ore resource and our pilot plant test work shows excellent results using Palamin magnetite."

In terms of the framework agreement between the three parties, a project team has been put in place and is expected to deliver a detailed feasibility study by the end of 2010 for a 500 000 tonne per annum iron-making opportunity at Phalaborwa. ■

Drastic new steps to halt copper theft

Public Enterprises Minister Barbara Hogan says copper may be designated a precious metal to make it more difficult for thieves to trade in the frequently stolen commodity.

Copper cable theft is so rampant that it costs South Africa's economy billions of rands and adds to delays in crucial sectors such as freight rail.

The Democratic Alliance (DA) estimated SA lost about R7 billion a year to metal theft.

Declaring it "precious" would be one of numerous initiatives under way to combat the theft, which also disrupts commuter transport.

Ms Hogan said in a reply to a parliamentary question that copper theft on the rail network caused delays, which meant the normal 19 hours for container traffic on the Gauteng-Durban route could more than double to 40 hours.

Containers being freighted from Gauteng to Port Elizabeth/ Ngqura take 40 hours to reach their destination because of cable theft in Gauteng.

Transnet Freight Rail spent at least R30 million last year on replacement costs, and Eskom R38 million. The combined losses incurred at Transnet and Eskom due to copper theft increased by 38,1% in 2008-09 and the replacement costs increased by 57,4%.

Mineral resources director-general Sandile Nogxina said that he supported the proposal, which he had discussed with the departments of energy and public enterprises.

His department would submit proposals to the Cabinet to have the Precious Metals Act amended to include copper as a precious metal. "It is clear that the problem they have needs to be resolved," Mr Nogxina said.

But designating the metal precious would not be simple.

According to a top mining legal expert, who requested anonymity, designating copper as a precious metal would mean that individuals seeking to trade in copper would require permits and authorisation from the South African Diamond and Precious Metals Regulator.

This will, "on paper, make it harder for thieves to sell the metal", the legal expert said.

But because the Precious Metals Act prohibited the possession of "raw" precious metals, designating copper as a precious metal would be difficult as most copper cables were finished products.

According to the South African Mineral Research Organisation, Mintek, several other measures have been put in place to combat copper cable theft.

Mintek's GM for business development, Roger Paul, said attempts were being made to use aluminium to coat copper cables. This would make it even harder for thieves to strip the cables.

"There are also plans in place to add certain components to the copper to make it easier to fingerprint and to establish where the metal originated from," Mr Paul said.

In her reply Ms Hogan said other measures being taken to tackle copper theft included conversion from copper cable to tiger wire, increasing the number of security guards in the hotspot areas, and the establishment of a joint working relationship with the Hawks, the National Intelligence Agency and the National Prosecuting Authority, which would result in the apprehension and conviction of cable thieves.

DA MP Pieter van Dalen said that Transnet should focus on improving security and should "stop hiring private security companies to guard the copper cables. It is not in the interest of private security companies to stop copper theft," he said. "Transnet needs to hire motivated and dedicated people who will take ownership of the problem." ■

SAIF and MCTS to exhibit at Afrimold exhibition

South Africa holds major potential for investment in the mould-making, tooling, design and application development industries which are vital components of manufacturing products for both local and export markets.

South Africa is simply not doing enough to attract the right type of business or to become internationally competitive to its true potential.

This is a situation that the inaugural Afrimold Exhibition, highlighting the critical mould-making, tooling, design and application development industries that are the foundation of all manufacturing, aims to be a prime catalyst in overcoming.

"It is time that the local tooling industry gears itself to taking on the opposition head-to-head. Our tooling companies not only need to become more involved and more innovative, they need to get more competitive," says Ron MacLarty managing director of the Afrimold exhibition that takes place at the Sandton Exhibition Centre from 16-18 August.

"Good toolmakers will never see a recession or an economic downturn; they are always in short supply anywhere in the world," adds MacLarty. "South Africa needs to encourage tool and mould-making as a career and profession with appropriate education and training. Our goal should be to benchmark ourselves against the German industry and to realise our potential to be able

“Production and manufacturing is the backbone of an economy. Afrimold will draw attention to this and highlight the need for skills development and training for future tool and mould makers in South Africa.”

to take on the likes of China in exports of tooling, moulding and design solutions."

Management at EDM Shop -- a specialist provider of CNC mills, high speed machining centres, CNC lathes, Wire EDM machines, RAM EDM machines and surface grinders to tool rooms, -- have strong views on the South African industry.

EDM Shop director Steven Andrews says the South African Tooling industry is "in tatters" because the country is exporting its natural resources which are then converted into tooling and products that are then re-imported.

"We're missing out on the most important and profitable part of the value chain. There needs to be real change and although government is making hesitant steps in the correct direction they are still missing a vital point.

"All their efforts are based on creating new BBBEE- based businesses instead of helping existing and profitable businesses become BBBEE with access to cutting edge technology, creating a market for their abilities and more importantly, creating sustainable employment.

"If we can get some DTI officials to visit and spend time at Afrimold perhaps some of these issues can be debated with the people that are making the real effort and spending real money, trying to improve the tooling industry as represented by the people exhibiting at and visiting Afrimold."

Andrews adds that he does not believe the first Afrimold will create any valuable export contracts as the exhibitors are mostly companies that are currently importing their wares and selling them in South Africa. However, he thinks South Africa could be a valuable trade partner, in the mould industry, to Europe and the USA as there are no language barriers, "we still have good skills and we have a labour force that could easily be trained into the 'Eastern model' of manufacturing tooling and producing product."

Major South African steel and high performance metals supplier Bohler Uddeholm Africa, an exhibitor at Afrimold, also has strong views. "The industry needs to wake up," says Chris de Wet, the company's Gauteng manager for steel and high performance metals, adding that the Afrimold exhibition could not come at a better time.

"After all, production and manufacturing is the backbone of an economy. Afrimold will draw attention to this and highlight the need for skills development and training for future tool and mould makers in South Africa, an area into which Bohler Uddeholm is directing a lot of effort."

He adds that Bohler Uddeholm is adding value with specialised steel, heat treatment technology and machining. "With our roots in Austria and sourcing high quality product from our top steel mills in Europe and South America, we have easy access to considerable reservoirs of knowledge, technology and innovation."

David Owen, general manager sales and marketing at tool steel and specialised metals supplier Schmolz & Bickenbach South Africa, says the major competition lies in the Far East and the South African industry needs to focus on becoming more competitive. He believes a more flexible and co-operative labour environment would assist.

"I also believe Afrimold is a serious step in the right direction for us, providing a platform for the local industry to demonstrate to foreign markets that it is vibrant and capable with the potential to become a strong international competitor."

unitemp, the South African agent for hot runner systems manufactured by Thermoplay of Italy for the plastic injection moulding industry welcomes the Afrimold Exhibition. "Our market involves plastic packaging in general, including cosmetics, domestic appliances, medical equipment and automotive components," says unitemp marketing and PR manager Natalie Liddle. "We need to be alert to new trends and directions in overseas markets and Afrimold is a significant opportunity for the local tool, die and moulding industry to benchmark itself and ensure the industry remains vibrant and competitive."

Shared stand for SAIF and MCTS

The South African Institute of Foundrymen (SAIF) and the Metal Casting Technology Station (MCTS) at the University of Johannesburg have booked space and will be exhibiting on a shared stand at Afrimold. The exhibition gives the two organisations the platform to showcase their abilities to offer industry training and technical services to the foundries and other sectors of the metallurgical industry.

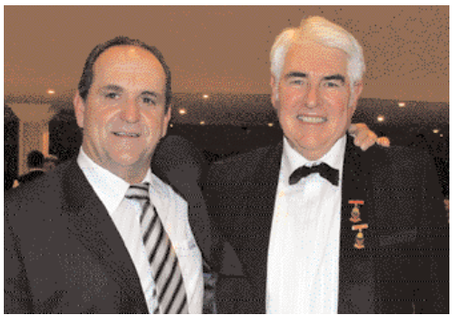
For more information contact Ron MacLarty at Afrimold South Africa on TEL: 072 353 6699 or email: ron@afrimold.com or visit www.afrimold.com ■

SAIF's 47th Annual Awards Dinner

The South African Institute of Foundrymens' 47th Annual Awards Dinner was held at the Emperors Palace, Convention Centre, Kempton Park, Gauteng on Friday 4th June 2010.

The guest speaker for the evening was ex-international rugby referee Andre Watson who gave us some interesting insights into the world whereby everybody thinks they are better than the man in charge.
John Davies was the Master of Ceremonies for the evening.

The SAIF would like to thank Lil Sales for sponsoring the wine on the tables.



Guest Speaker Andre Watson with John Davies

Awards handed out on the evening were as follows:

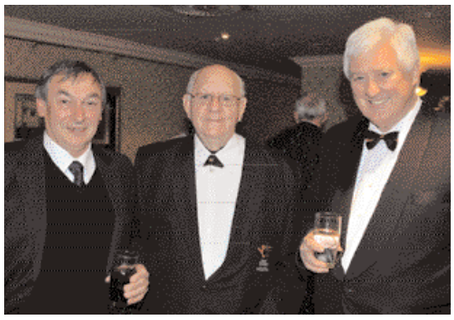
A H Guy Award - Presented to a member for outstanding service to the foundry industry - Danny O'Connor

Sasol Synfuels Procurement and Marketing/Insimbi Alloy Supplies Award - For the highest marks achieved by a 1st year metallurgy student - Randani Prince Mokgopo

Foseco Award - For the best final year metallurgy student - Tumelo Elvis Ntsoane

Honorary Member Award - Presented to a member for outstanding service to the Institute - Tony O'Brien

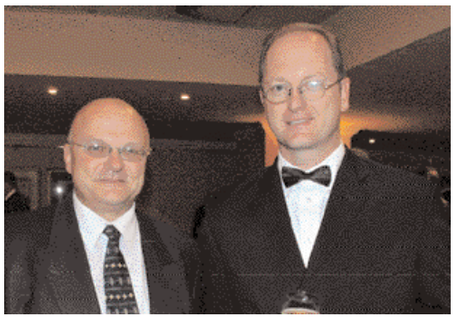
Past President Award - Mark Potgieter



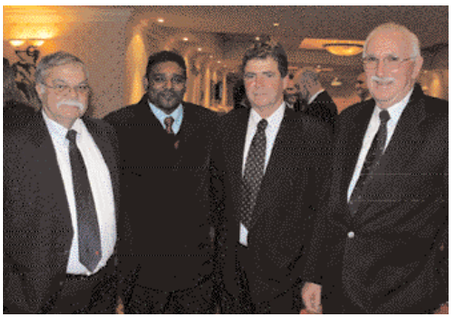
Arrie Schriek from Volclay, Vic Du Plooy from University of Johannesburg and Tubby Boynton-Lee

Willy Polis, current WCIF President, Ray van Rooyen of Insimbi Alloy Supplies and Nigel Pardoe of Thomas Foundry

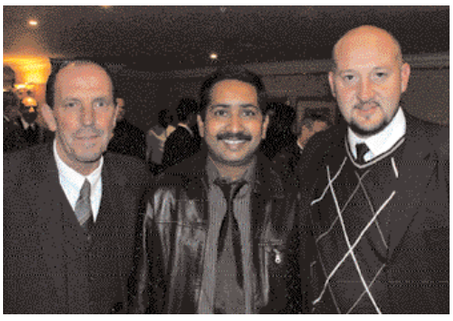
Rob Horsman of Foseco, Johan Bekker, Darren Korver of Foseco, Peter Forbes of Forbes Bros Foundry and Martin Coker of M.I.S. Engineering



Ian Gibson of Rely Intracast and Adrain Paine of SimLogic



Luis Dias of Endeco, Joel Reddy of Transnet Foundries, Fubio Ciani of Procor and Monty Plenderleith of Beta Castings



Guy Dockray of HA Falchem SA, Marlin Moodley of M.I.S. Engineering and Derick Elliot of Procor

Paul and Pavel Coelho of Lusafica and Carlos Palinhos of Rely Intracast

Andries and Anne Erasmus of Thermal Ceramics with Claude Du Toit and Anne Kent, both of RMS

Pieter Schutte of Insimbi Alloy Supplies with Christo Muller of Sasol Synfuels

Back row: Hannes Nel, Dudley Thomson, Alex Thomson and Greg Smith all from JC Impellers and in the front Heidi Nel, Sue Thomson, Tiffany Marriott and Brenda Smith

Mike Stephenson of Presssure Die Casting, Anton Wessels and Paul Wilke, both from Cobra Watertech and Graham Smith of Presssure Die Casting

Paul Johnston of Thomas Foundry, Mike Holton with Mike Retief of Ceramic & Alloy

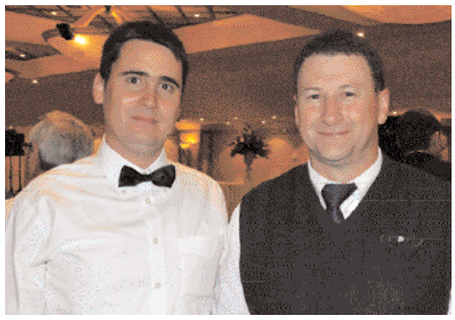
Mike Wolhuter of Pressure Die Castings being presented with his gift of an overnight bag (in case he needed it) by Stephen Reid of Zealous Pressure Castings

Brendan Homann of Insimbi Alloy Supplies presenting the Sasol Synfuels Procurement and Marketing / Insimbi Alloy Supplies Award for the highest marks achieved by a 1st year metallurgy student to Randani Prince Mokgopo

Acting SAIF President Enno Krueger presenting the A H Guy Award - presented to a member for outstanding service to the foundry industry. The award was presented to Danny O'Connor, and Pieter Schutte collected it on his behalf

Mark Wynn of Foseco South Africa presenting the Foseco Award for the best final year metallurgy student to Tumelo Elvis Ntsoane

The Thomas Foundry group: Joao Rodrigues, Barry Butler, Nigel Pardoe, Clayton Anderson, Paul Johnston, Pieter van der Lith, Greg van Deventer and sitting is Bennet Thambekeni

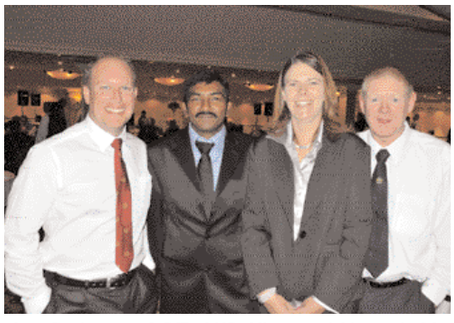


Alexander Saam of Fochem and Lance Deysel of Pressure Die Casting

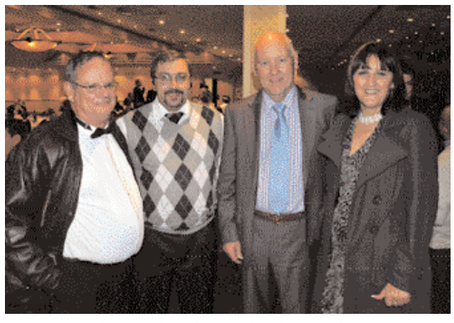
William Price of Prima Industrial Holdings, Greg Mac Rae of Franktech Metallurgical Services, Kevin van Niekerk of Lauds Foundry Equipment and Dave van Niekerk of DVN Marketing

Gary Coull and Graham Hardisty, both of Zealous Pressure Castings with Robert Hallaby (centre) of Aluminium Copper Processors

Mike Morrisse and Grant Estman, both of Viking Foundry, with Manie Gouws of Foseco South Africa



Iain Dickason of GfE -MIR Alloys and Minerals SA, Ricky Munsamy of L and S Thermal, with Janley Kotze and Reon Heard, both of GfE -MIR Alloys and Minerals SA



James Roodt, Rocky Bernardes of B & K Foundry, Mike Kleynhans of Elmacast and Bets Kleynhans

Front: Brendan Ferns, Andrew Kilian, Christo du Preez, all of Hayes-Lemmerz South Africa and back, Brian Clough from Elmacast and Stephen de Souza-Alegria of Hayes-Lemmerz South Africa

New energy efficiency hub on cards for SA

A Memorandum of Understanding (MoU) was signed recently opening the way for the establishment of the so-called South African Regional Energy Efficiency Centre (SAREEC), which is expected to begin operations within 24 months.

Once developed, the centre will offer research and information, as well as energy-efficiency product validation for builders, designers, architects, utilities, governments and manufacturers.

The MoU was concluded between the South African National Energy Research Institute (Saneri), the Council for Scientific and Industrial Research (CSIR) and the Association of Architectural Aluminium Manufacturers of South Africa (Aaamsa).

The purpose of the agreement was to facilitate the establishment of a centre for testing of the energy efficiency performance of building-envelope components, as well as to provide a Southern African hub for research and development. Its creation would be funded through various local and foreign entities.

The centre would house a testing laboratory, as well as training facilities and would be developed within the existing infrastructure of the CSIR, incorporating expertise from the built environment and the natural resources and the environment units.

Saneri CEO Kevin Nasiep, CSIR research and development group executive Dr Thulani Dlamini, and Aaamsa executive director Hans Schefferlie would be responsible for the establishment of the centre.

The MoU recognised that the SAREEC would:

- Share technical cooperation at various levels and provide information on energy-efficient building technology.
- Facilitate commercial activities to provide services, products and processes related to energy efficiency (including the introduction and transfer of advanced technologies from overseas) through joint ventures and foreign investment.
- Organise training and demonstration projects on energy efficiency.
- Coordinate and develop educational activities in energy efficiency, including distribution of publications, public education, and training classes and seminars.
- Document and publish energy efficiency case studies online.
- Provide the basis for quality energy efficiency programmes that boost local economic activity.
- And, meet the needs of building owners and operators, engineers, architects and utilities.

Schefferlie said that efforts would also be made to avoid duplication of work and structures.

"The centre will carry out quality programmes that will support the local industry," said Dlamini. ■

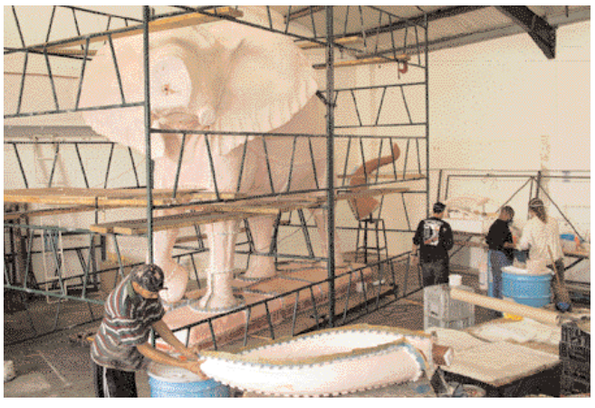
The trunk, head and shoulders of Nhlangulene

Details revealed about elephant sculpture at Cape Town International Airport

Airports Company South Africa, Cape Town International Airport (ACSA CTIA) in partnership with Out of Africa Children's Fund unveiled the Big Five sculptures in May 2010, near the Central Terminal Building. The two works of art, an elephant and lion will also double up as giant 'piggy banks' for receiving public donations for the charity.

Nhlangulene

The magnificent bronze sculpture of the elephant, Nhlangulene, is the work of world renowned South African artist Jean Doyle and was manufactured and assembled at the Doyle Art Foundry in Wynberg, Western Cape before being transported to Cape Town International Airport. The massive sculpture took two years to complete.



The manufacture of the life size bronze of Nhlangulene took two years

Nearing completion with Jean and Mike Doyle in the foreground

The magnificent bronze sculpture of the elephant, Nhlangulene, is the work of world renowned South African artist Jean Doyle

Nhlangulene about to be hoisted onto the truck that would take him to the Cape Town International Airport

The Nhlangulene bronze weighs in at three tons with a height of 4.5 metres, a width of 3.5 metres and the length from trunk to tail is 6.6 metres.

The real Nhlangulene was one of the first bulls introduced into the Kruger National Park, and became famous for his immense size. Standing 340 cm at shoulder height, his tusk lengths were 317 cm (left) and 305 cm (right).

Nhlangulene was named after the Nhlangulene Spruit, a tributary of the Mbhatsi which runs south west of the N'wanetsi, where he spent most of his time. Nhlanguleni is a Tsonga word meaning 'at the magic guarri'. He was known to be secretive and rarely seen. Little is known of this mysterious elephant with an unobtrusive lifestyle which died of natural causes at an estimated age of 55. He is nevertheless a worthy member of the great tuskers of the Kruger National Park.

After his death in 1987, patrol rangers recovered his tusks which can be seen today at the Elephant Hall museum in the Letaba rest camp, Kruger National Park.

Nhlangulene's right tusk was shorter and lighter, as he had broken it sometime earlier in his life.

Jean Doyle is one of South Africa's leading bronze sculptors. She chooses her subjects with care and explores deeply. Her realism cloaks universal truths and hides a sometimes revolutionary spirit. Her work is in private collections all over the world. ■

R100 million investment to boost Gauteng economy and job creation

A new R100 million investment in training and skills development in the vehicle manufacturing industry is a vital injection in the economy of Gauteng, says Ms Amanda Nair, the Chief Executive Officer of Blue IQ.

A world-class Supplier Incubation Facility (SIF) has been established in Pretoria as a joint initiative between the Gauteng Provincial Government and the Ford Motor Company of Southern Africa.

Blue IQ, the agency responsible for flagship projects such as the Gautrain, Newtown and the Nelson Mandela Bridge, facilitated the new training facility at Ford's assembly site in Silverton.

The Gauteng Government has committed R50 million for the construction of the facility and an additional R15 million for start-up costs for BBBEE companies. A further R32 million is allocated for training and development programmes at the assembly plant.

The SIF will be attached to the Ford Motor Company's production facility following its recent R3 billion investment to produce the T6 next-generation compact pick-up truck. An Economic Impact Report recently concluded that Ford's T6 Model will contribute R79 billion to the Gauteng economy over the next 15 years and create almost 700 000 direct and indirect employment opportunities.

The investment meets a number of objectives in support of the economic growth of Gauteng:

The new investment will boost employment opportunities in the automotive industry. More than 400 people will be trained during 2010 and a further 50 people will benefit through the incubator programme. A four-year training and development plan is in place to develop skills and ensure the growth of a globally competitive workforce.

BBBEE companies will benefit by becoming suppliers to the main stream of automotive manufacturing. The technologys upport and skills transfer will provide an ideal learning ground for these new companies.

The Public Private Partnership between Gauteng and Ford serves as a blueprint for future projects. Gauteng will continue to promote PPPs in the manufacturing sector.

Gauteng's reputation as an attractive destination for investment is strengthened which will benefit the economy of the entire SADC region. It will also boost the country's position as an export base for vehicles and components.

Foreign Direct Investment in the province has been boosted with the project attracting at least two more companies to form part of the T6 programme.

The investment confirms the importance of a globally competitive auto industry as a key economic sector in the country.

Ms Nair says Blue IQ considers the automotive industry as a primary growth sector in the future of Gauteng. Blue IQ is responsible for two subsidiaries within this sector namely the Automotive Industry Development Centre (AIDC) and the Automotive Supplier Park. Both subsidiaries will benefit from the new investment.

The Provincial Government has demonstrated its commitment to growth in the automotive industry by including this sector in its industrial policies and future strategies.

Government has provided the land adjacent to the Ford facility upon which a 7 200 square metre factory will be constructed. At least four new black businesses will be established at this factory to perform value-add sub-assembly work to main suppliers on the vehicle production line.

"Our objective is that these BBBEE companies will acquire the skills and experience to eventually become full-fledged suppliers to the South African automotive sector," says Ms Nair.

Huge setup and investment costs have, in the past, limited opportunities for smaller enterprises to participate in this industry. The new initiative will assist prospective suppliers to overcome these hurdles.

An Economic Impact Report recently concluded that Ford's T6 Model will contribute R79 billion to the Gauteng economy over the next 15 years and create almost 700 000 direct and indirect employment opportunities

A governance board will be established between Ford, its major suppliers and government to evaluate applications, award opportunities to participate and monitor their performance.

Blue IQ and its subsidiaries in the automotive sector will provide business training and mentoring while Ford and its suppliers will be responsible for the technical training, quality control and the monitoring of safety standards.

At the conclusion of an initial 10-year period the SIF will either be transferred to Ford or continue in its existing form depending on the requirements of the company at that time.

Ms Nair says the project confirms the value of Blue IQ as a facilitator of strategic infrastructure that supports economic growth and job creation. "The PPP model we have put in place is working well. We are delighted that Ford has continued to expand their manufacturing commitments in the Province of Gauteng. The ongoing collaboration between Ford and the AIDC, and the management role that SPDC execute over the construction of the new Supplier Incubation Facility highlights the strong level of confidence Ford has in the Province and our work. We look forward to continuing to work closely with them for their benefit and for the benefit of the people of Gauteng", she says. ■

KEW Foundries provides sheave wheels for largest hydro electric project in India

KEW Foundries was awarded the contract to supply the Shaft Sinkers group with sheave wheels to be used on the largest joint sector hydro electric project in India - the Teesta Hydroelectric Project for Teesta Urja Limited.

The project marks an expansion of the Shaft Sinkers operations portfolio into arenas outside of commodity mining, and is the first Shaft Sinkers project to be conducted on Indian soil.

"KEW Foundries is our preferred supplier when it comes to sheave wheels," says Petra Dippenaar, Group Procurement Manager, Shaft Sinkers. "With the success and safety of a project hinging on critical components such as sheave wheels, it makes nothing but perfect business sense to utilise a supplier which has consistently delivered the highest quality products, and has a proven record of excellence."

KEW Foundries is the sheave wheel supplier for the largest joint sector hydroelectric project in India. The diameters of the 43 sheave wheels supplied for this project range from 960mm to 2 555mm

KEW Foundries has worked together with METS, the mining and engineering technical services division of Shaft Sinkers, to design and develop the sheave wheels for the project. In total 43 sheave wheels have been supplied, with diameters ranging from 960mm to 2 555mm. Comprising the order are four Kibble sheave wheels, nine stage headgear sheave wheels, five sliding sheave wheels and 25 stage sheave wheels.

The project, located in India's Sikkim province, involves the sinking of two pressure tunnels known as the Teesta - 1 200 MW Pressure Shafts, which will both have final diameters of 5.4 metres and total depths of 630 metres. The tunnels are expected to take two years to sink.

The sheave wheels will be used as part of the shaft sinking vertical transport infrastructure for Shaft 1 and Shaft 2. The main function of the sheave wheels is to bear the load carrying capacity of the winder and to guide the winders ropes in the shaft.

Shaft Sinkers currently has 70 percent of the global market share for sinking shafts deeper than 1 000 metres. The company, traditionally involved in commodity mining, has expanded its portfolio of operations to include non-commodity mining and projects such as the Teesta hydroelectric project. "We are currently expanding the scope of our operations to include undertakings in emerging markets. Our expertise is required in sinking endeavours which include hydroelectric initiatives, nuclear waste disposal and non-commodity mining," says Dippenaar.

According to Dippenaar, KEW Foundries' unrivalled product quality and service delivery has established a positive working relationship between the two companies which will continue to grow new business. "We view KEW Foundries as a strategic business partner and will continue to work with the company in our business endeavors around the globe."

For more information contact Jaime Goncalves, Technical Director KEW Foundries on TEL: 053 841 0474 ■

Document for preparing Industry Waste Management Plans prepared in line with the requirements of Part 7 of The National Environmental Management: Waste Act, 2008 (Act No. 59 Of 2008)

Waste management is one of the key features of a company's environmental management system, whether the system is formalised or not.

It is recognised that waste can be well managed in an environment where it is planned for, with clear objectives and targets set and implementation measures designed to achieve such objectives and targets.

This planning requirement is now legislated and entrenched in the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008,) (hereinafter referred to as the Act), with the industry sector expected to prepare and implement Industry Waste Management Plans (Industry WMPs).

This document has been prepared as a guide to assist towards the preparation of such plans. The document highlights different role players, their roles and responsibilities and aspects they need to consider when involved in the preparation of Industry WMPs towards compliance with the requirements of the Act.

The guideline describes process issues, whereby step by step procedures for each major role player are described. It also highlights and elaborates on those substance issues and areas as listed in section 30 of the Act that may need to be considered for inclusion in an Industry WMP.

Two types of plans (mandatory or voluntary) may be prepared. The guideline provides a description of situations where either a compulsory or a voluntary plan may be prepared. It also describes processes that need to be followed when preparing either type of plans. Since Section 30 of the Act already provides a list of possible contents of the plans, it is presented in this guideline that, the contents of plans may only differ in terms of scale at which the plans are being prepared at.

Those plans being prepared at individual company level will have specific, small scale targets set within the confines of the facility, whereas those plans being prepared for a larger number of companies within a sector will have broader targets.

It is presented in this document that, whether the plans are prepared by a person, category of persons or industry or organs of state as defined in the Act, both types (mandatory and voluntary) when submitted to the authorities will ultimately be subjected to a similar approval process. The plans will need to be reviewed and updated from time to time at intervals to be determined during the authorisation. The Industry WMP holders will therefore be expected to comply with conditions as will be stipulated during the approval.

Failure to comply with the requirements to prepare the plans, amend the plans or comply with conditions of approved plans will constitute an offence and may lead to the non-compliance actions instigated against offenders.

The document can be downloaded from the Department of Environmental Affairs and Tourism website: www.deat.gov.za ■

SAIF Annual Golf Day 11th November 2010

The South African Institute of Foundrymens' Annual Golf Day will take place on Thursday 11th November 2010 at the Reading Country Club.

The format of the golf day is a fourball alliance two scores to count. Bookings for the day will be on a first come first served basis and payment must be made in full before the day otherwise the no pay no play rule will be enforced.

There are a number of tee boxes, greens and entire holes that are available for sponsorship. These can either be manned or have advertising banners displayed.

The Institute is also looking for prizes in sets of four. All sponsors and prize donor names will be displayed appropriately on documentation that will be on the tables at prize giving, will be read out on the evening and will also be published in Castings SA after the event.

Details of costs are available from Bets at the SAIF on TEL: 011 559 6455, email: betsk@uj.ac.za

Power tariffs to large municipal users to surge in 2010/11, survey finds

Business and industrial consumers in the Ekurhuleni metropolitan area of Gauteng province will be hardest hit.

A newly released comparison of proposed municipal electricity tariff increases for 2010/11 shows that business and industrial consumers in the Ekurhuleni metropolitan area of Gauteng province will be confronted with a 57% surge in prices when compared with 2009/10 tariffs, while the average proposed increase across 11 large municipal areas surveyed would be 22%.

The study, which was prepared by utility pricing company NUS Consulting South Africa, was based on the "highest voltage maximum demand" tariffs available to clients requiring electrical capacity of 1,5 MVA over a 12-month period. Customers falling into this bracket would include large manufacturing companies, or enterprises such as large bakeries or paint producers, or even large commercial or retail complexes.

GM Stephan Dolk said that the comparison was based on the proposed increases submitted for approval by the municipalities to the National Energy Regulator of South Africa (Nersa) and were, in the main, at the upper end of Nersa's recommended increase range.

The analysis found that Ekurhuleni's tariffs in this category would increase by 28c/kWh to 77c/kWh, making industrial tariffs in the metropolitan area second highest after those charged in Johannesburg, where 80c/kWh was proposed for 2010/11.

Durban's proposed increase came in next highest at 30%, which would raise tariffs to the category of consumers surveyed to 71c/kWh and make that city's tariffs the third highest among the councils surveyed. Johannesburg's City Power, meanwhile, proposed a hike of 28% for the second year in succession.

NUS Consulting indicated that Richards Bay's proposed increase of 12% would be lowest of those surveyed and would sustain its position as the council charging the lowest tariffs to business customers, at 44c/kWh - only slightly more expensive than the 41c/kWh charged by Eskom to direct business customers. However, Dolk noted that there were discrepancies within the Richards Bay tariff structure that it had been unable to clarify ahead of publication.

NUS Consulting had previously recommended that municipal tariff increases should be kept to a level at least 5% below Eskom's increases, or at 28,9% as from July 1, 2010 - the difference between the 25% granted and the 28,9% figure quoted arises owing to the fact that the municipalities will apply the increases for nine months, from July 1, 2010 to March 31, 2011, while direct Eskom customers began paying the higher tariff from April 1, 2010.

Nersa granted Eskom average tariff increases of 25% for the three-year period from April 1, 2010, to March 31, 2013, with business and industrial tariffs to rise ahead of that average in order to protect households, especially poor households.

“Many municipalities have played ball in a very difficult environment by applying for quite moderate electricity price increases,” Dolk said, adding that he hoped that Nersa would be able to intervene in those instances where the increases were excessive.

"Many municipalities have played ball in a very difficult environment by applying for quite moderate electricity price increases," Dolk said, adding that he hoped that Nersa would be able to intervene in those instances where the increases were excessive.

On June 2 and June 3, Nersa held hearings at which 19 municipalities' applying for above-guideline increases motivated for the deviation.

The guideline was for increases of 22% in the 2010/11 financial year for those municipalities that implemented a 25% increase in the 2009/10 financial year; 19% for those that implemented a 34% increase in the 2009/10 financial year; and a proportional percentage increase for municipalities that implemented an increase between 25% and 34%, or below 25%.

Municipalities raised various reasons for their above-guideline proposals including the need for increased maintenance and repairs, capital expenditure, and to enable them to fill staff vacancies, especially for scarce technical skills.

Nersa said that, while it recognised the different cost structures for different municipalities, it would not want to see a vast difference in the tariffs structures and levels. ■

Insimbi Alloy Supplies staff embraces the spirit of the 2010 FIFA World Cup

For decades, people have viewed the Football World Cup as a means to jointly celebrate the game of soccer and the international community. The 2010 FIFA World Cup has been no exception and South Africans along with all the visitors to the country have embraced this spirit. With the world media focussing its attention on South Africa, the country has showcased the vibrancy of Africa and the colour and diversity of South Africa.

A month before kick-off Insimbi Alloy Supplies staff were given the task of designing their own poster that would best represent one of the 32 participating countries allocated to them by management. The small groups of four and five set about their assignment enthusiastically, with most showing off their hidden artistic skills.

Hours before the opening ceremony on Friday 11 June the much anticipated results of which 'team' had won was announced by CEO Pieter Schutte. Mexico triumphed with Australia, New Zealand, Slovakia and Chile filling the rest of the top five spots. ■

Top: The top five posters and the teams that created them

Left: The winning Mexico poster

Far left: Like the rest of South Africa the Insimbi staff took Football Friday seriously

Developing bio-urethanes for no-bake and cold-box molding

UNI/MCC researches a replacement for phenolic urethane, with improvements in environmental factors, binder performance, and casting quality.

By Mitch Patterson and Jerry Thiel

The Center for Advanced Bio-based Binders (CABB), a project funded by the U.S. Department of Energy and conducted by the University of Northern Iowa Metal Casting Center (UNI/MCC; www.mcc.uni.edu) has focused on developing binders and processes that use bio-renewable materials to lower emissions, volatile organic compounds (VOCs), and hazardous air pollutants (HAPs) in foundries. UNI continues to push forward in making the foundry more efficient with economical use of renewable resources. Currently, the university has developed two new patent pending metal casting bio-urethane sand binders.

Phenolic urethane's fast-cure and high-strength qualities have made it the world's most widely used foundry binder. Phenolic urethane binders work when a polyfunctional alcohol (part 1) reacts with a polyisocyanate (part 2) in the presence of a tertiary amine (catalyst) to create a urethane. In no-bake applications the catalyst for the reaction is a liquid amine; cold-box processes use atomized amines such as DMEA, DMIPA, or TEA in a nitrogen carrier gas. In phenolic urethane chemistry, the part 1 resin is based on phenol and formaldehyde, both considered HAPs. The system requires thinning the resins with solvents for proper sand grain coating. Solvents are traditionally comprised of aromatic compounds, although dibasic ester and fatty acid methyl ester (biodiesel) solvents have been included to improve properties while lowering emissions and HAPs.

The bio-urethanes

UNI has developed bio-urethanes focusing on the replacement of the part 1 resin. The first new bio-urethane is based on the saccharides of corn syrup. Saccharides are a family of carbohydrates that range from small molecules, sugars, to very large carbohydrates, such as cellulose and starches. Saccharides are considered polyfunctional alcohols as they contain many alcohol groups that can react with the isocyanate resin. The low cost, availability, and environmental friendliness of corn syrup and many other saccharide sources make it a suitable, bio-based part 1 replacement. Additionally, saccharides are compatible with reactive solvents that are low in HAPs and VOCs.

The second bio-urethane is based on the humic acids of lignite. Lignite or brown coal fits between coal and peat. Lignite contains humic acids derived from decayed biomolecules. The humic acids contain many alcohol groups available for a reaction with the isocyanate resin. When in a suspension of reactive solvent, lignite also can reinforce the additional polymer to increase core strength. Lignite is readily available and mined in areas all over the world, making it a suitable bio-based part 1. The lignite resins also are compatible with low HAP and VOC solvents.

UNI's bio-urethanes serve as a direct replacement of phenolic urethane. The binders employ an isocyanate resin (part 2) and an amine catalyst very similar to phenolic urethane no bake and cold box binders, so current standard foundry equipment can be used. With identical processes and mechanisms as phenolic urethane, the bio-urethane binder systems can be integrated into existing foundry operations with ease.

Casting advantage

Traditional phenolic urethane binders tend to soften as the temperature increases: at 200 °C, more than half of the room-temperature strength is lost. This influences the most import property of a binder, casting quality. Unlike phenolic urethane, tests in the bio-urethane binders have shown a lack of thermal softening. Testing has shown that the UNI bio-urethane binders exhibit less core distortion than conventional phenolic urethane binders. Both thermogravimetric analysis (TGA) and elevated temperature tensile testing have revealed that the lignite binder retains properties longer than phenolic urethane. However, the binder quickly and completely degrades around 250 °C. The high temperature strength retention is followed by a quick degradation period for improved dimensional accuracy, with excellent shakeout properties.

The thermal profile of the saccharide urethane also yields unique casting properties. This binder is similar to the lignite binder as it too experiences a quick degradation period. Unlike the lignite urethane, the saccharide urethane retains additional strength after the casting has been poured. Caramelization of the sugar is thought to be the cause of the increased retained strength.

Environmental advantage

Replacing the phenolic resin in the part 1 has several environmental advantages. The base materials are less dependent on petrochemicals and show less market price fluctuation. When making molds, the characteristic phenolic urethane smell produced by the part 1 is eliminated, and the workplace contains fewer odors, VOCs, and HAPs during mold and coremaking. When compared to a traditional phenolic urethane no-bake, both bio-urethanes generate over 50% reductions in overall emissions of HAPs during pouring, cooling, and shakeout.

Mold gas emissions are a serious concern of operating foundries, and replacing the conventional part 1 with bio-urethane showed a reduction in excess of 80% in phenol and formaldehyde emissions. Foundries can keep the reaction speed and flexibility advantages of a urethane binder

while drastically reducing emissions.

Foundry trials

The new bio-urethanes have been successful at producing aluminium, brass, gray iron, ductile iron, and steel castings. The binders have been rigorously tested in both no-bake and cold-box applications at the UNI foundry, as well as in several foundry trials.

The first foundry trials were run at McWane-Clow Valve in Oskaloosa, IA. Castings poured included a 4-in. ductile iron valve body with a 35-lb. bio-urethane no-bake (BUNB) core and a 16-in. gray iron valve body with a 250-lb BUNB core. Both castings showed improved casting quality and required no shakeout: white core sand fell to the ground.

Next, the bio-urethane binders were tested at Progress Castings in New Hampton, IA. There, the castings poured included an aluminium ATV engine head with a lignite based bio-urethane cold box (BUCB) core. Cores were cured using DMIPA gas with a cycle time of 40 seconds. Testing of the finished products showed excellent casting results 15 minutes after cores were produced. It was notable that the BUCB cores did not show the core stain usually associated with the conventional urethane cores.

Foundry trials were conducted at John Deere Waterloo foundry in Waterloo, IA. Three castings were chosen to test the binders in medium to large sized castings. A grey iron axle housing, harvester discharge elbow, and 4000 lbs grey iron slag pot. Casting results included excellent shakeout and surface finish without the need for core coatings. All of the castings exhibited casting surface finishes comparable to conventional urethane binders.

The bio-urethane binders were next tested at Viking Engineered Cast Products in Cedar Falls, IA. Cores were produced for both pump casings and impellers produced from CF8M stainless steel. Viking reported that castings poured using the bio-urethane cores exhibited less hot tearing and crack than conventional ester cured phenolic cores normally used. Possible carbon pickup was evaluated but not detected in any of the castings poured.

Binder evaluation

The new bio-urethanes were developed by UNI to be foundry-ready. The improved shakeout of the two binders without sacrificing casting quality is ideal for many foundry applications. This means less time and energy for shakeout and less shakeout damage. It's also expected that the foundry will also see a safer mold and core room environment with improved emissions on the production floor. The binders decrease our dependence on petrochemicals by using materials grown or mined all over the world. Thanks to strong industry support, the funding for the CABB project has been extended and UNI will continue to develop innovative binders and processes.

Mitch Patterson is the project manager and Jerry Thiel is the director at the University of Northern Iowa's Metal Casting Center, which coordinates academic research capabilities and resources for private-sector, industrial applications. Contact the MCC at TEL: + 319-273-6894. ■

Aluminium melting furnaces for die casting

Cost factors in the melting shop

Authors:
Dipl.-Ing. Klaus Malpohl, Manager Development, StrikoWestofen GmbH
Dipl.-Ing. Rudolf Hillen, Development Melting Technology, StrikoWestofen GmbH

The cost situation of a foundry is largely influenced by the efficiency of the melting shop. As the non-ferrous metals processed in the melting shop are very expensive, metal loss is an important cost factor. For aluminium a metal loss of 1% of an annual melting output of 5,000 tons corresponds to a financial loss of more than 100,000 EUR. Given a yield of 50%, this amount must be allocated to castings weighing a total of 2,500 tons. Hence the lost metal means extra costs of 5 to 10 cent per one kilo casting weight. This is a not to be neglected magnitude.

Also energy consumption may vary largely depending on the melting process used. Here not only the efficiency of the plants proper but all other factors affecting overall consumption must be considered, including all auxiliary energy sources. Likewise all maintenance-related and wear parts costs must be included in the cost considerations as well as the effort associated with the operation of the plants. Considerable cost savings can be realized, e.g. when mechanical devices capable of charging complete transport container loads are used instead of manual loading.

Another important aspect is the quality of the metal produced by the melting and holding plants, as this is a key prerequisite for a high-quality casting

Another important aspect is the quality of the metal produced by the melting and holding plants, as this is a key prerequisite for a high-quality casting. The number of useful direct testing methods in the melting shop is very limited. This makes it very difficult to determine and document the quality, especially as there are no universal assessment criteria. Against this background it is vital to be able to reproduce proven procedures of the overall process as reliably as possible to guarantee a uniformly high quality of the melt. This especially refers to procedures such as checking of incoming material deliveries, "gentle" melting of the raw material, correct treatment of the metal and last but not least maintenance of the melting and holding equipment.

There is no universal answer to the question as to how the melting and holding facilities in an aluminium die casting plant should be designed. As a general rule, clear separation between melting and holding is recommendable. In the melting shop, not only solid metal in the form of ingots is melted but also the returns from the casting operation such as ingate systems overflow recesses and scrap. Mixing virgin material and returns has a positive effect on nucleation during solidification. Further tasks performed in the melting shop include the treatment of the molten metal and the holding of the melt at pouring temperature until it is being used.
The following proven rule has remained valid even for today's foundry operations: "Fuel for melting and electricity for holding." This rule takes into account the more favourable costs of natural gas and mineral oil versus electricity and the high thermal energy demand of aluminium melting processes.

A full version of this paper is available from Ceramic and Alloy Specialists. If you would like a copy please contact Mike Retief on TEL: 011 894 3039 ■

The 69th World Foundry Congress - WFC2010

The Foundry Institution of Chinese Mechanical Engineering Society (FICMES) will be the host of the 69th World Foundry Congress (WFC2010) that will be held in Hangzhou, China in October 16-20, 2010.

The theme chosen for the Congress is Green Foundry. The reason behind this choice is that our world is facing the pressures of energy, resources and environment. Therefore, how to explore new casting technologies and methods for energy conservation and environmental protection is, indeed, a crucial problem that needs to be solved for the sake of harmonious and sustainable development between human society and nature.

Hangzhou is a dynamic city as well as an international tourist city. It has earned a reputation by Italian renowned traveller Marco Polo, as 'the most beautiful and magnificent city in the world'. Hangzhou is a 2200-year old, famous cultural and historic city. It is one of the seven ancient capitals of China.

The 69th World Foundry Congress (WFC2010) is sponsored by World FoundyMen Organization (WFO), Chinese Mechanical Engineering Society (CMES) and Foundry Institution of Chinese Mechanical Engineering Society (FICMES).

For further details visit wfc2010.com

China International Foundry Exhibition 2010

The China International Foundry Exhibition 2010 - CHINA FOUNDEX 2010 will run concurrently with the 69th World Foundry Congress.

The exhibit content includes high quality castings, foundry equipment, raw and auxiliary material, detection instrumentation, furnace, foundry technology software, foundry technology, consultation and trade cooperation. Exhibits will focus on small size actual products, samples and audio-visual materials. ■

Metalurgia grows 12% in number of exhibitors and will be one of the largest exhibitions in the sector in 2010

Metalurgia is the most important show in the segments of casting, forging and aluminium in Brazil.

The seventh edition of the Metalurgia, International Fair and Congress on Technology for Foundry, Forging, Aluminium and Services, scheduled for September 14 to 17, 2010, brings together in Joinville, Brazilian and foreign exhibitors from the entire production chain of the foundry, forging and aluminium industry. Held every two years, Metalurgia is known for the opportunity for technological improvement, business generation and professional retraining. Compared to the 2008 edition the show has grown 12% in number of exhibitors, bringing together close to 450 companies, spread over an area of 20,000 m² in Expoville's two pavilions, 15% higher than the previous event.

Metalurgia is the most important show in the segments of casting, forging and aluminium in Brazil in 2010, the largest in occupied space and number of exhibiting companies. According to Richard Spirandelli, Marketing Manager of Messe Brasil, the event already has its consolidated public. "About 90% of exhibitors from the previous edition renewed their contracts, attracted by the potential business that Metalurgia offers," he comments.

A benchmark in products, solutions and alternatives for the modernization of manufacturing facilities, Metalurgia 2010 has exhibitors from Brazil and eight other countries - USA, Mexico, Spain, Chile, France, Germany, Italy and China, bringing what is the most modern in technology for this industrial market. The fair is organized by Messe Brasil and has the support of the Brazilian Foundry Association (Abifa), the Brazilian Aluminium Association (Abal) and Brazilian Association of Non-Destructive Testing and Inspection (Abendi).

Market outlook

According to data from Abifa, the foundry sector, which is part of metallurgical, in 2009 had a 30% drop in production volume, keeping pace with the slowed economy. For 2010, forecasts made by Abifa (Brazilian Foundry Association) are encouraging and the market should begin growing once again. "A survey conducted in late 2009 shows an expected growth of 25% compared to last year. Santa Catarina should follow or even exceed this average due to the growth of local companies observed in the beginning of the year," says Devanir Brichesi, president of Abifa.

According to the president, fairs such as Metalurgia, which best represents foundry interests in Santa Catarina, are essential to the visibility of companies in the domestic and international scene. "Metalurgia is an efficient alternative for generating new business for companies in the segment. Who participates ends up having more visibility in the market and the trend is that they will be among the preferred suppliers by the companies in the sector," states Brichesi.

For him Santa Catarina occupies a privileged position in the foundry market compared to other states. "Just consider the presence of Tupy, one of the largest companies in the segment in the world, as well as others no less important in the domestic and international market," concludes Brichesi.

For further details visit www.feiras.messebrasil.com.br/metalurgia ■

High-frequency economy of operation!

High-frequency grinding technology is superior to pneumatically driven tools.

High-frequency (HF) grinding tools are considerably cheaper than comparable tools driven by compressed air in terms of investment, maintenance costs and energy consumption. HF tools also offer greater productivity. This is the conclusion reached by Bosch in surveys in which the efficiency and cost-effectiveness of the types of drive used for grinding larger welded or cast parts was compared. A study by a German technical university confirms these statements.

Differences already become apparent in the comparison of the motor characteristics curves, which give information about the grinding performance and the wear on the grinding wheels. High-frequency grinders show only a slight drop in rotating speed (three to five percent) as power increases, while uncontrolled compressed air tools show a drop in speed of up to 50 percent even before maximum power is reached. Another consequence of this is that working with high-frequency tools at a high and constant speed leads to a reduction in grinding wheel wear of up to fifty percent. Furthermore, high-frequency grinders offer up to 15 percent more material removal, which improves productivity.

High-frequency technology cuts energy costs

A comparison between high-frequency grinders and pneumatic grinding devices of comparable power also reveals significant differences in the energy balance. For example, HF test units have an energy consumption of 2.5 kilowatts of electrical energy per hour, while pneumatically driven grinders require 166 cubic metres of compressed air. At a cost of 75 cents per kilowatt hour of electricity, a high-frequency grinder thus causes annual energy costs of about R4500.00 per year. If we calculate 15 cents for one cubic metre of compressed air, a pneumatic grinder causes annual energy costs of about R59 000.00, 13 times the costs for a HF unit!

Additional cost advantages for high-frequency technology arise from the supply of energy, since electric wiring is practically maintenance-free. In components generating pressure, or in high-pressure hoses, however, leaks are relatively common. This means that the compressor has to compensate for this loss by working more. Even a tiny hole with a diameter of 1 mm causes increased energy costs for the production of compressed air and a 5 mm leak would increase the additional cost for energy by as much as 20 times per annum.

A cost factor that should not be underrated is also the work and costs involved in the maintenance of the compressed air equipment whereas a high-frequency converter with the entire installation periphery, on the other hand, is practically maintenance-free.

What is high-frequency?

High-frequency is the term commonly used to describe power tools or motors with an application of three-phase current with the frequency increased to 200Hz or 300Hz, resulting in a high performance and low weight motor. This increased frequency results in a power increase of 4-6 times that obtainable from an equivalent 50Hz induction motor whilst retaining a tough durable motor construction.

High-frequency tools are always classed as production tools because of the reliability of the machines and increased power and work rate. HF electric tools are the most reliable, cost effective, low maintenance tools and have the highest power to weight ratio of any tool anywhere without compromise - up to 400 watts per kilogramme of machine and up to 2.5 times this value when worked at short periods at top performance levels.

High-frequency tools and machines are widely used in steel, foundry, fabrication, armed forces and construction industries throughout the world solely for their reliability and the ability to work in environments where others fail, and just keep on working hard.

Efficiency

When comparing compressed air and high frequency systems, the overall efficiency of a compressed air system seldom exceeds 15%, whereas high frequency systems regularly exceed 60%. The economical utilisation of power gives special significance to this difference in operating costs and has enabled many organisations to make a valuable contribution to their power savings by changing from inefficient systems to an efficient High Frequency system. Abrasive discs and wheels, particularly modern types containing zirconium, can only cut efficiently at optimum peripheral speeds. Because High Frequency motors develop maximum torque within 5% of their free speed, significant savings of up to 50% can be made on abrasive costs.

Safety

Due to the inherent characteristics of induction motors the maximum speed cannot be exceeded i.e. over-speed. This is a major safety factor when using abrasive wheels. Systems operating at 135v/200hz/3~ are centre tapped with an earth potential of 72volts. 200v/300hz/3~ have an earth potential of 115V.

All Bosch High Frequency tools conform to the following standards or standard documentation: EN 792, EN 50144, in accordance with standard regulation 89/392/EWG.

For more information contact BSE Distributors on TEL: 011 452 9688 or email: adam.marcinko@wbs.co.za ■

Silicon-on-sapphire pressure transducers

Ellison Sensors has developed its range of pressure transducers and transmitters.

Using the silicon-on-sapphire sensor technology, with its latest digital electronics, the new range of process pressure transmitters and transducers are one of the most advanced ranges available in the market today.

This range is aimed for industries requiring process pressure measurement, including requirements such as high temperature or those requiring sensors with higher levels of resolution and better long term stability.

Silicon-on-sapphire is known for the superior technology for high accuracy pressure transducers. This replaces solid state silicon and silicon-on-insulator technologies.

The sapphire measuring diaphragm eliminates the insulation break down and the instability that is found in silicon pressure sensors that enables the transmitter to operate at high temperatures. Sapphire is elastic with no measurable Hysteresis, which allows these transducers outstanding levels of repeatability.

The GS4200 USB digital pressure transducer is powered solely by the USB port of a PC. Data is displayed on the PC and can be logged and recorded, making this an ideal solution for pressure measuring tests and requirements.

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

Optical Emission Spectrometry

Based on the know-how of many decades Bruker Elemental offers a complete portfolio for elemental analysis. Their innovative solutions enable a wide range of customers in the metal and automotive industry, chemistry, pharmacy, and semiconductor industry to elevate their business into new levels of quality and process control.

Spark optical emission spectrometers (S-OES) are the ideal instruments for metal analysis. From pure metals trace analysis to high alloyed grades, spark OES covers the complete range from sub-ppm to percentage levels. All relevant elements can directly be analysed simultaneously.

Bruker OES training in South Africa

Bruker Elemental, represented by IMP in South Africa, visited the company in March 2010 to install a Q8 OES and to provide hands-on service training to the IMP technical service and support team.

The training covered all service and software related issues to enable the company's technicians to provide a complete service and support backup for the Bruker Elemental Optical Emission Spectrometers offered by IMP.

IMP Group of Companies

The IMP group of companies was founded in 1987. The core philosophy of applying innovation to meet the needs of customers has resulted in steady growth of the company. The Group today has operations in South Africa, Australia, the USA, and Brazil, with more than 140 employees globally.

As with any high-technology venture, the company's strength resides in the creativity and dedication of its people. IMP employs an impressive complement of qualified engineers, technologists, technicians and other technical staff with considerable formal training and experience.

There are three main operating divisions

IMP Automation is a global leader in turn-key mining laboratory design and implementation with automated, semi-automated and manual facilities in most industries from aluminium to zinc, from sampling to analysis. IMP also supports, maintains and in some cases, even operates the laboratories. IMP is well positioned to provide an innovative solution for sampling, sample preparation and analytical laboratory requirements within the mining industry.

IMP Scientific supplies instruments, equipment and consumables for use in:

- Biological instruments
- Industrial instruments
- Analytical instruments
- General laboratory equipment

IMP Calibration Services provides service and backup for products supplied by the automation and scientific divisions. Regular visits to overseas suppliers and manufacturers for additional training ensures that the company's service and support staff is kept up-to-date with the latest developments in the market.

For further details contact IMP on TEL: 011 916 5000 or email info@imp.co.za or visit www.imp.co.za ■

The Haas GR-510 gantry-style router

The Haas GR-510 is a gantry-style router with 3073 x 1549 x 279 mm travels and a powerful 40-taper milling head. Its 10,000-rpm spindle and a powerful 15 hp (11.2 kW) vector drive system provides the power to cut aluminium and other metals, as well as the speed to cut wood, plastics and other light materials. A 10-pocket automatic tool changer is standard. Featuring rigid steel construction, the GR-510 provides a very stable platform for heavy cutting. The machine's 3099 x 1536 mm fixed table provides plenty of support for large and/or heavy workpieces, and the gantry assembly travels the length of the table on heavy-duty linear guides for low friction and extreme accuracy.

Powerful brushless servomotors and high-pitch ballscrews combine to produce rapids up to 53.3 m/min for reduced cycle times. The Haas control features advanced tool management, single-button features, 15" color LCD monitor and a USB port.

For further details contact Haas Factory Outlet on TEL: 011 974 2301 ■