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For years countries have worked to impose export restrictions, duties and taxes designed to keep scrap metals at home, presumably so their domestic mills, smelters and foundries would have access to raw materials at more affordable prices.

At the beginning of August 2021 the new South African export duties on scrap metal came into effect.

However, government’s decision to extend the price preference system (PPS), which forces a discount on the local sale of scrap metal, and still introduce an export duty that was supposed to replace the system, seems to have been done in bad faith, say some.

From August 1 both restrictions will run parallel for two years. Industry and trade experts say it is unreasonable, irrational and arbitrary.

According to a Treasury document a growing number of countries have imposed export duties on raw materials in order to enable domestic industries to get them at a lower price than foreign manufacturers and capitalise on the competitive advantage on raw materials and other inputs, including labour.

Scrap metal is an important feedstock in the production of downstream metals due to the relatively lower energy consumption and its lower carbon footprint versus other metal production processes. It is widely seen as a strategic resource and many countries have scrap metal policies and regulations in place to support the development of their domestic metal producing industries.

Export taxes on scrap metals are used in a few countries, and especially amongst a few of the large BRICS countries. According to the most recent update in the OECD’s inventory of export restrictions on industrial raw materials, 32 countries have applied some form of export restriction on scrap metal (15 out of these countries make use of an export tax on scrap metal). In terms of ferrous scrap, 14 countries impose an export tax which is as high as 40%. As an example, China charges (40%), Russia (15%) and India (15%) whilst some countries impose an absolute tax per ton. In some countries duties will comprise the base rate and a specific amount per ton in US$. The value of the latter will be computed depending on the kind of metal (for non-ferrous metals) or the conversion degree of products (for ferrous metals), subject to global price dynamics.

But, in light of the current economic conditions, it seems allegations of protectionism designed to benefit domestic consumers of scrap material have been more frequent, much to the dismay of the scrap metal recycling industry.

Unfortunately, this sort of protectionism is hurtful to the scrap recycling industry, recyclers say, because the sector depends upon free and fair trade on an international scale.

Therefore, scrap metal recyclers naturally are concerned as more countries across the globe discuss or implement measures designed to restrict the export trade of scrap metals by way of various taxes, duties or other restrictions. One of the latest to do so is Malaysia.

But I say what about the thousands of components and products that are being imported from the likes of China at ridiculous prices as compared to the cost price of what is made locally. More than likely these components and products would have been manufactured from one of our base raw materials that have been exported. Surely we should be imposing more import duties?

Keeping precious commodities at home. But what about the cheap imports that are doing more damage?

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

Council Appointments for 2021

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

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SI Group
The Substance Inside

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Spectro introduces Spectromaxx LMX09 arc/spark OES analyser

Next-generation improvements deliver ultra-reliable performance.

Spectro Analytical Instruments has announced the newest version of its Spectromaxx arc/spark OES analyser with next-generation improvements for the ultra-reliable advanced analysis of incoming and outgoing materials at metal producing and fabricating plants. Perhaps the industry’s best-selling OES analysers, Spectromaxx instruments are a critical element of supply chains worldwide.

The introduction of Spectro’s new, ninth generation Spectromaxx LMX09 analyser represents a dramatic leap forward in speed and value. Users get ultrafast information to react rapidly to changing process conditions. The new Spectromaxx also provides a drastically reduced cost of ownership with lower consumables, plus advanced diagnostics and easy maintenance that increases availability and prevents expensive downtime.

Features of the new Spectromaxx LMX09 arc/spark OES analyser include:

- Fast, simple standardisation with Spectro’s proprietary iCAL 2.0 calibration logic - needing only five minutes and a single sample per day, rather than the 30 minutes, multiple samples and reruns required by conventional analysers.
- Significant reductions in argon (Ar) gas consumption - 6% to 12% during operation and 18% to 64% during standby - without impacting performance.
- An expanded wavelength range with the option of a new UV optic to handle a spectral range from 120 nanometers (nm) to 235nm, extending analyses to elements such as nitrogen (N), carbon (C), sulfur (S), and phosphorus (P) as well as hydrogen (H) and oxygen (O) in titanium (Ti) base materials.
- Improved ease of use with routine, trouble-free analysis of 10 matrices, 68 methods, and 56 elements, plus easier access and new software features.
- Effortless operation with Spectro’s Spark Analyser Pro software, featuring application profiles, automatic programme selection,
New functions include the ability to recall stored spectra for later re-evaluation/recalculation, extended data export functions, quick check programmes for the rapid analysis of iron and aluminium and onsite upgrades/ additions of analytical methods without any hardware changes.

- Hardware improvements, including a new spark stand configuration with easier access for automation options, a new optic isolation concept for greater temperature stability, UV optic (on Spectromaxx Advanced), an ultra-robust, high-power plasma generator with spark frequencies up to 1 000Hz, start/stop averaging button/spark indicator and on/off safety switch to control line/mains power.

- Adapter kits offering a variety of flexible, easy-to-use solutions to meet the wide range of analysis requirements of material control, from adjusting for differing sample shapes and sizes to optimising positioning on the spark stand.

The new Spectromaxx Advanced adds a new UV optic with four high-resolution CMOS detectors. Its extended wavelength range covers elements from 120nm to 235nm. A closed system circulates gas through Spectro’s UV Plus cleaning cartridge, eliminating extra argon consumption and contamination risks. Both versions feature a temperature-stabilised system that heats both optics. Both are available as floor-mounted units with optional PC stands or benchtop models for a minimum footprint.

All Spectromaxx analysers are supported through Amecare services to help ensure uninterrupted performance and a maximum ROI life. Amecare services include machine-to-machine support, which provides proactive alerts and an on-request PC connection with a remote Spectro service expert.

The new Spectromaxx LMX09 arc/spark OES analyser is available immediately from Spectro Analytical Instruments. For more information visit https://www.spectro.com/maxx.

For further details contact Spectro Analytical South Africa on TEL: 011 979 4241 or visit www.spectro.com.

The introduction of Spectro’s new, ninth generation Spectromaxx LMX09 analyser represents a dramatic leap forward in speed and value. The new Spectromaxx LMX09 arc/spark OES analyser is available in two models, differing only in their optical systems.
Progress at Atlantis Foundry proves the value of energy management

Here are varying opinions of the significance of cost of energy as one of the major challenges facing the foundry industry. In the midst of numerous production and sales challenges, does it really benefit a plant to spend time and money on energy management?

Evidence from the National Cleaner Production Centre (NCPC-SA) seems to suggest it is not only worthwhile, but it is a business imperative, particularly in light of the energy insecurity we face in South Africa. The NCPC-SA has developed numerous case studies to demonstrate how an assessment followed by implementation of energy management or optimisation of energy intensive systems, can shave millions off the cost of production across multiple industrial sectors.

One such case study was completed at Atlantis Foundry in the Western Cape, following seven years of energy - and water - efficiency interventions. In 2012, Atlantis Foundry approached the Automotive Industry Development Centre (AIDC) to assist them with identifying saving potential in their operations. The AIDC had recently formalised an agreement with the NCPC-SA, with the objective of implementing resource efficiency and lean manufacturing interventions in the automotive sector.

Following an assessment by the NCPC-SA, a number of potential energy and water efficiency improvements were identified.

Thembi Kodisang-Sibanda was the NCPC-SA project manager responsible for the project. “Because Atlantis Foundry was a manufacturer of blocks for automotive internal combustion engines, they were also part of the automotive sector. And it was our relationship with the AIDC that created the link.”

It was a proactive move by Atlantis Foundry which has proven well worth it – and began a journey that would result in an average of 37 000 MWh per year electricity savings.

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According to Kodisang-Sibanda and her colleagues at the NCPC-SA, the potential for energy saving varies from plant to plant, depending on a number of factors. But it is almost always there, even where energy improvements have already been made - the notion of continuous improvement is the basis for the international energy management standard, ISO 50001.

“No matter what technology is used, melting of metals is energy intensive. Atlantis Foundry uses induction furnaces for melting its ferrous feedstock, therefore of the various challenges they are faced with, the cost of electricity is a prime one,” she says.

Based on the opportunities identified in the assessment, as well as further improvement identified as the energy management projects unfolded, the Atlantis Foundry team, with involvement of Plant Engineer André Arendse and his now retired colleague Erwin Lisser, implemented a total of nine energy improvement projects between October 2013 and December 2019. A trial was run on an additional project, but this was discontinued because it prevented an increase in production.

A control system to limit maximum electrical demand was installed and power factor correction equipment was upgraded by repairing defecting units and installing new ones. Lights were replaced by LEDs, and variable speed drives (VSDs) were fitted to dust extraction system fan motors. Active harmonic filtration was applied to melting furnaces in order to prolong the life of nearby equipment. Cooling towers were fitted with drift eliminators to reduce water loss, and cooling tower water supply and fan operation was improved.

Overall, the projects resulted in energy consumption reduction of over 28%.

Financing energy improvements

When making recommendations to industry, the NCPC-SA has repeatedly found that one of the major reasons companies give for not implementing their recommendations is the cost, or investment needed to make the changes. The Atlantis Foundry success shows that this is often a misconception, and that maintenance and CAPEX costs can be recouped in surprisingly short timeframes. In this case, the payback period for the energy project improvements is calculated at 0.18 years – just over two months of savings achieved.

Often, a mix of funding sources and modalities can be used. At the Atlantis Foundry plant, for example, the changes...
on the dust extraction systems were done on a shared savings basis, with the contractor being paid for the equipment installed out of the financial savings achieved. The NCPC-SA also offers technical assistance with financial linkages. “Companies can consider applying for the 12L tax incentive, as an example. Atlantis Foundry has definitely qualified for this, by showing evidence of energy efficiency improvements, with verified energy savings. Our energy team can assist with this process, from savings verification to submission of the application.” “I really want to encourage more companies in this sector to contact us and see if assistance is possible,” concludes Ms Kodisang-Sibanda. “The NCPC-SA is managed alongside the NFTN in the CSIR, and between the two programmes, we sincerely want to support not only the foundries, but all the companies along the metals value chain to become more sustainable and competitive.” As for Atlantis Foundry, Arendse says that the next phase of the journey is to work towards ISO 50001 certification. ISO/SANS 50001 is the international energy management standard, and achieving certification requires evidence of continuous improvement in energy management, through an energy management system aligned to the ISO 50001 guidelines. It is a standard widely adopted in Europe, and particularly Germany, but South African companies have been slow in realising the benefits of the approach, and currently less than 30 companies are certified in South Africa. “The NCPC-SA has already agreed to support us on this phase as well, and we are looking forward to the results.”

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The NCPC-SA is a national industry support programme funded by the Department of Trade, Industry and Competition (the dtic) to support industry with the transition to a green economy. The NCPC-SA uses the methodologies of resource efficient and cleaner production to improve efficiencies and competitiveness at industrial plants.

Written by Julie Wells, Operations and Communication Manager NCPC-SA.
For more information or assistance visit www.ncpc.co.za or email ncpc@csir.co.za
SI Group signs agreement to sell industrial resins business to ASK Chemicals

Agreement includes products, technology, and manufacturing assets in Brazil, India and South Africa.

In separate press releases ASK Chemicals and SI Group have announced that they have agreed on the purchase of SI Group’s industrial resin business and associated manufacturing sites in Brazil, India and South Africa, as well as licensed technology and multiple tolling agreements globally by ASK Chemicals. The transaction is expected to close later this year.

SI Group will carve out the rubber and adhesives business, oilfields and surfactants, as well as foundry products in Brazil, and will operate tolling agreements with ASK Chemicals.

SI Group’s industrial resin business serves a wide range of markets and applications such as foundry, friction, abrasives, refractory, paper impregnation, insulation and composites.

With this acquisition, ASK Chemicals is reinforcing its position in the foundry market and at the same time strengthening its non-foundry business, the company said.

The agreement is for the SI Group to sell the majority of its global Industrial Resins business to ASK Chemicals, a portfolio company of private equity firm, Rhône Group. Rhône Group is a global private equity firm, specialising in mergers and acquisitions, leveraged buyouts, recapitalisations and partnerships with particular focus on European and Trans-Atlantic investments. Other companies included in the company’s portfolio areilly (coffee industry), Zodiac Fluidra (pool equipment) Hudson’s Bay Company (department stores) and Rexair (vacuum cleaning systems) amongst others.

The transaction includes SI Group’s industrial resin products and associated manufacturing sites in Rio Claro in Brazil, Ranjangaon in India and Johannesburg in South Africa as well as licensed technology and multiple tolling agreements globally. ASK Chemicals, headquartered in Hilden, Germany is a market leader in the foundry materials sector and manufactures binders, coatings, feeders, filters, and release agents, as well as metallurgical products including inoculants, inoculation wires and master alloys for iron casting.

“We remain confident that this is the right strategic move for our employees and our business. ASK Chemicals has proven industry expertise that will add significant value and continuously enhance these businesses. The deal also allows us to focus more intentionally on building and growing our portfolio as a performance additives powerhouse,” said David Bradley, President and CEO of SI Group.

SI Group will carve out related businesses at these sites, including the manufacture of rubber and adhesives, oilfield, and surfactants, as well as foundry products in Brazil, and will operate tolling agreements with ASK. The company will also retain the Industrial Resins businesses in the US and China.

ASK Chemicals in South Africa

ASK Chemicals has had a long relationship with the South African foundry industry. Various manufacturing companies have had license agreements to manufacture their products locally. These include Applied Chemicals, AECI/Chemserve with the latest being Chemsystems, a division within AECI.

Through various mergers, acquisitions and joint ventures the names of Ashland, Südchemie, Kernfest, Clariant and Ashland-Südchemie-Kernfest GmbH have all been associated in South Africa.

ASK Chemicals is represented in 25 countries with 30 sites, 20 of which operate their own production, and employs approximately 1 800 people worldwide. With research and development in Europe, America and Asia, ASK Chemicals sees itself as the driving force behind industry-specific innovations and is committed to offering customers a consistently high level of quality. Flexibility, quickness, quality and sustainability as well as cost-effective products and services are of key importance.

July 2019 announcement

In July 2019 a similar announcement was made by ASK Chemicals and the SI Group. In November 2019 the South African Competition Commission conditionally approved the proposed merger. The Commission found that the proposed transaction was unlikely to result in a substantial prevention or lessening of competition in any relevant markets. Nonetheless, in order to aid Chemsystems in the interim while it negotiates with any other IP supplier, the Commission imposed conditions to the approval of the merger requiring ASK to extend the current IP license agreement with Chemsystems for a period of a year. The Commission further found that the proposed transaction raises public interest concerns. The Commission imposed a condition that the merging parties shall not undertake any forced or involuntary retrenchments as a result of the merger for a period of five years.

April 2020: SI Group announces termination of agreement

In April 2020 the SI Group announced the termination of the agreement. COVID-19 was cited as one of the reasons but the biggest stumbling block was that the Brazilian authorities did not give the go-ahead. There has been no reason given as to why the Brazilian authorities have now agreed to the acquisition by ASK Chemicals.

SI Group South Africa is a crucial foundry partner

In 2004 Schenectady International, Inc. (now known as the SI Group), through its South African affiliate, Schenectady South Africa (Pty) Ltd reached an agreement to partner in South Africa with Hüttenes-Albertus Chemische Werke GmbH (HA) by acquiring Hüttenes Albertus Falchem (Pty) Ltd and Zeta Resins (Pty) Ltd’s foundry and timber chemical intermediates business.

In 2010, in order to streamline operations in South Africa and make the group more cost effective, it was decided to flatten this structure and incorporate HA Falchem SA (Pty) Ltd into the SI Group, and SI Group South Africa (Pty) Ltd was formed.

With this latest announcement it again leaves HA without a local manufacturing partner.
Thomas Abrasives quits production of carbon shot in South Africa

With the recent reports of the company's furnaces being sold to a scrap dealer in Witbank, Mpumalanga it confirms definitively that Thomas Abrasives will, at least in the foreseeable future, not be manufacturing carbon shot in South Africa.

Thomas Abrasives has been manufacturing cast steel abrasives in Germiston, Gauteng since it was established in 1984 as a division of Thomas Foundry (Pty) Ltd. Started by one of the doyens of the industry, the late Terry Ryan, and his partner Brian Thomas, the company initially began manufacturing low carbon steel shot to supply both the South African and export shot markets. By 1989 it was apparent that further growth was only possible with the manufacture of steel grit and the plant was converted to a high-carbon manufacturing operation. Two years later, in March 1991, Thomas Abrasives (Pty) Ltd was formed.

In 1995, Thomas Abrasives was sold to the Wheelabrator Allevard Group of France with Terry Ryan staying on as Managing Director of the company until his retirement in 1997. The company had a name change in July 2012, shortly after its 50th anniversary. The Winoa Group, as it is now known, is the largest steel abrasives manufacturer in the world with 14 production plants located in Europe, North and South America, Russia, Asia and South Africa.

The Winoa Group, a French company headquartered in the Isère region. KKR subsequently seized control Winoa in a debt restructuring of the company after its previous private equity owner refused to inject cash.

2017 March KKR sold Winoa to US-based GP KPS Capital Partners. Thomas Abrasives falls under the W Abrasives portfolio. There is very little news published about W Abrasives. The company has a relatively new CEO who it is said is in a 'clean up' mood. Besides closing the manufacturing plant in South Africa he has also closed the company’s plant in the US and made some crucial management changes.

Thomas Abrasives supplies major local and overseas manufacturers with steel shot and grit abrasives. 30% of its production is supplied to local clients, including many in the foundry industry. The company had a monthly production capacity of 2 600 tons. There was no comment from the company and there is no news on the other equipment except that most of it has been cut up and sold off as scrap.

It is believed that the company stopped manufacturing in 2020.

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Some say the health of a country is defined by the strength of that country’s manufacturing sector. The scope and scale of manufacturing have changed considerably in the intervening centuries, but the challenge of defining ‘manufacturing’ has not gone away. If anything, changes in the ways manufactured goods are developed, produced and sold have made manufacturing more difficult to define and to link to a particular location, and have made it more difficult to identify workers whose jobs are related to manufacturing.

Manufacturing accounts for some impressive figures in most advanced economies. However, it is a segment of the overall economy that does have its ups and downs over the years though, from offshoring to job cuts: Manufacturing is influenced by major economic developments and broad international trends. The latest factor affecting manufacturing is technological change, and its various effects on individual manufacturing operations and on workforce demographics.

Many of the recent changes in the manufacturing industry have been driven by consumer demand. Consumers want things faster, more individualised, and newer than last year or even last quarter. Therefore, manufacturers have had to keep up with not only the demand for new products but with finding skilled workers to make these products. New and advanced manufacturing technologies have helped to better meet consumer demand. In the foundry industry 3D printing is a great example. But not all foundries or processes can adapt to this technology.

It was therefore very refreshing to visit Protea Foundry, located in Vanderbijlpark Gauteng, a foundry that predominantly produces copper-based castings for a range of industries. At first glance from street level you are deceived about what to expect. But once past the administrative buildings you are impressed by the size and the action that is happening on the floor. And, all of the work in this foundry is done in the traditional way in which foundries have operated for many decades. There is no fancy equipment or systems deployed – just conventional foundry operations producing quality castings.

What is more impressive is that the foundry is managed by the daughter of the original founder and his 80-year-old wife who is still actively involved in the company on the administrative side even though he himself has been retired for over 20 years. On top of this the family-orientated business is no longer owned by the family and has not been since 1997.

Charles Taylor had trained as a moulder at the Union Steel Corporation (USCO) Vaal Works (today known as the Vereeniging Works) in Vereeniging, the first company in South Africa to produce steel, before deciding to venture out on his own and start a foundry in 1979. The foundry was established on the back of an order for Iscor, the state owned steel manufacturer before it was

Protea Foundry – a family-orientated business with private corporate ownership
privatised in 1989 and then subsequently purchased by ArcelorMittal South Africa in mid-1991. Taylor had no real foundry experience except for his moulding capabilities. Coming from a ferrous environment it was somewhat surprising to all that knew him that he began his own business and foundry manufacturing non-ferrous components. The contract with Iscor was to supply small bushes and Taylor did so from a small rented space in a bigger factory in Meyerton, that housed an engineering company owned by his brother, with the help of a couple of employees.

The stay in Meyerton lasted a year before Taylor had to find bigger premises because of increased orders and this he did in Vanderbijlpark, which is only 27kms from Meyerton. It also meant that Taylor was closer to his client, one that Protea Foundry still supplies today. Iscor had built a steel works in Vanderbijlpark and had started trading in 1947.

Taylor started the company with two 160kg furnaces that were powered by diesel. These two furnaces were the mainstay of his melting capacity until 1984 when he purchased land and built his own factory to house the foundry and the supplementary operations. Protea Foundry still occupies the same facility but now it is housed under 3 500m² of roof space after many additions have taken place.

With a new focus Taylor also made the move from diesel furnaces to gas fired furnaces, not only to become more efficient and cost effective, but also because of the availability of gas being piped in directly. Taylor would make another change six years later when he switched to induction furnaces and the company still runs its melting requirements with induction furnaces.

Initially the company purchased four Inductotherm furnaces of various sizes but through upgrading it now runs two Inductotherm furnaces and three DVS furnaces ranging in size from 150kW to 350kW, which more than accommodate the range of castings that the company manufactures – between 100 grams and four tons (gross).

Centrifugally spun cast components in high nickel bronzes

“Dad did dabble in aluminium castings for a while but decided to concentrate on copper/bronze based materials and castings particularly when the company decided to produce centrifugally spun cast components in high nickel bronzes for clients. This began in 1992 and we now have five machines in our spun cast department and they make up about 60% of our monthly tonnage cast,” explained Jacky O’Grady Moutinho, daughter of Charles Taylor and the current General Manager.

“I initially worked part-time for the company helping my mother Corry with the administration side such as accounts and quotes. I joined the company full-time in 1985 and had...
Besides floor and spin casting Protea Foundry also offers chill casting. The type of castings that Protea Foundry mainly produces lend themselves to be pre-machined. The company has 11 lathes of various sizes at their disposal.

“Some of the components and products that we manufacture, or let me rather say a few of them, are labyrinth seals, earth moving equipment, spindle and bearing segments, hydraulic parts, water pump parts, piston and sliding rings, wear plates and rings, general machining components, bushes and solids, pattern jobs, gland bushes, worm gear blanks, mining equipment and crushers, face and side liners, housing screw nuts, turbine seals and many others.”

Family business changes hands

“There were seven children in the Taylor family and three of my brothers have also worked for the company at various times. My late brother Koos, who was the oldest of us siblings, Charlie and Chris have all been employed by Dad besides me and Mum.”

“The first ownership change came in 1997 when Dad sold the company to Anthoon Rheeders and Piet Odendaal.”

“Piet only stayed a short while before leaving the company in 2000, the year Dad finally retired. Anthoon continued to run the company before he sold 49.9 % to the PSG Group in Stellenbosch, Western Cape, whose founder and Chairperson for a long period was Jannie Mouton, in November 2007.”

“The next ownership change took place eight years later in July 2015 when the Sunset Bay Group purchased 100% of the shareholding. The Sunset Bay Group is privately owned by the Mahomed family and currently we are overseen by Zeyn Mahomed.”

“Within the group there are a number of other companies involved in beneficiating non-ferrous metals. Gold Circle Metals, for example, produces continuous cast bronze and is one of the largest stockists and distributors of non-ferrous semis in Africa. Gold Circle Metals stocks a variety of products such as brass and copper extrusions, earthing tape for electrical application as well as local and imported mirror-finished sheeting, shimstock, tubing, different qualities of cast bronze bar, oil impregnated bronze, aluminium bronze, cast iron solid bar and a variety of copper based ingot.”

“Other companies within the group include Derco Metals, Copalcor, Maksal and Vaal Triangle Metals which are trading and manufacturing divisions stocking and distributing various non-ferrous metals including plumbing tubes, air-conditioning tubes, refrigeration tubes, busbar and an extensive range of extruded, rolled and forged semi-finished and finished product in aluminium, copper, brass and other alloys.”

Casting

“Besides spun casting we also offer furan sand casting, which is 30% of our production, and also chill casting, which we do for challenging components with complex cavities. This

Besides floor and spin casting Protea Foundry also offers chill casting.

The type of castings that Protea Foundry mainly produces lend themselves to be pre-machined. The company has 11 lathes of various sizes at their disposal.
Casting partnerships towards success

The mandate of the NFTN is to manage, coordinate and facilitate growth and transformation in the casting industry through focused interventions designed to support improved foundry competitiveness, the industrialisation of new technologies and products.

The National Foundry Technology Network (NFTN) exists to advance the competitiveness of the local foundry industry, especially distressed foundries through a range of support services.

In an on-going effort to remain relevant to the sector and the economy, the NFTN has set revised strategic objectives for 2021/22:

- Support sector and firm efficiencies and compliance to ensure sector sustainability.
- Encourage localisation and robust supply chains to increase market access.
- Facilitate the establishment and delivery of effective, relevant sector skills development interventions.
- Develop and support the latest local technologies through relevant and focused research and development.
- Build mutually beneficial and productive relationships, through awareness-raising and stakeholder engagement.

The NFTN and the CSIR are committed to the furthering of the sector, and the accelerated delivery of the South African Steel and Metal Fabrication Master Plan.

For more information on support or partnerships, please contact:

nftn@csir.co.za

The National Foundry Technology Network is an initiative of the dtic managed by the CSIR.
involves pouring liquid bronze into a metallic mould making use of gravity. The cavities are formed by sand cores. These are either made by our core shooters or provided by suppliers who can quickly produce them.”

“We cast materials such as the aluminium bronze group, the brass group, high tensile brasses, the leaded bronze group, the phosphor bronze group, special high nickel bronzes for spun cast products only, high tin alloys, special alloys and the gun metal group.”

“Some of the components and products that we manufacture, or let me rather say a few of them, are labyrinth seals, earth moving equipment, spindle and bearing segments, hydraulic parts, water pump parts, piston and sliding rings, wear plates and rings, general machining components, bushes and solids, pattern jobs, gland bushes, worm gear blanks, mining equipment and crushers, face and side liners, housing screw nuts, turbine seals and many others.”

“Many of our castings end up at companies directly or indirectly such as Koeberg nuclear power station, Eskom power stations, Demag, Sulzer Pumps, Sasol, ArcelorMittal, Komatsu, Bell Equipment, Highveld Steel and FDL Schmidt.”

“One of the more interesting castings that we have done recently was for ArcelorMittal. The housing screw nuts are ordered very often but when they are they bring smiles to everyone’s faces. When cast they weigh about four tons and once machined they weigh about 2.7 tons. A very challenging casting to get correct but rewarding once completed.”

“We are generally left to run on our own. I have now got very good experience on the foundry processes and have attended and passed all the SAIF courses to broaden my knowledge. I made it my business to get to know how a foundry works on the manufacturing side and started to do that when Dad was still in charge. It certainly has put me in a position of confidence.”

“All materials are checked on our Bruker Q4 and certificates issued. With power not being reliable we have installed a generator that cost us R2 million and we are currently upgrading our two transformers. The furnaces are eight years old now so we could start looking at new ones.”

“We are not back at the levels that we were at a few years ago but that is understandable. The pandemic has not helped but we are not making that an excuse.”

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There is a saying that roughly goes by the general wording: The whole is greater than the sum of its parts. The problem with this though is that without quality parts, the whole has no chance of being truly greater than the sum of those parts. If one poorly manufactured component fails, it won’t matter, because the whole becomes dysfunctional. This couldn’t be truer for heavy duty primary crushing equipment and the team that was assembled to conceptualise and create a colossal casting for export to Europe.

South African Roll Company (Sarco) has long been recognised as one of the leading international manufacturers of castings used in the steel and non-ferrous manufacturing industries and has been manufacturing castings since 1947. With a new focus on heavy engineering castings and a dedicated heavy engineering castings floor, Sarco was the foundry choice for a European client of SSS Group of companies, specialists in crushing equipment, seeking a gyratory crusher full ring spider.

“In 2016 Sarco expanded their casting capabilities to service the local and international heavy engineering sector. A combination of sophisticated equipment, the latest technology, together with skills and experience acquired through over half a century in the business, positioned Sarco amongst the world’s leading roll manufacturers currently available to the steel industry,” explains SP van der Walt, Sales and Marketing Manager at Sarco.

A gyratory crusher has a crushing chamber designed to accept feed material of a relatively large size in relation to the mantle diameter. Their primary use is for initial size reduction to convert large materials into smaller ones. Ore is typically transferred by haul trucks which discharge the material into a feed hopper at the upper level of the crusher moving vertically downward past the spider assembly which supports and houses the upper main shaft bearing. Material is then crushed and this ore is then discharged from the bottom shell assembly at a significantly reduced size, ready to be further refined.

The actual crushing action is produced by the oscillation of the gap between the moving mantle liner, mounted on the central vertical shaft, and the fixed concave liners mounted on the top shell of the crusher. It is the mantle and concaves from the working surfaces of the crusher that produce the force required to crush the ore.

“With a team dedicated to the heavy engineering castings side, we have employed a dedicated sales and marketing, and technical team that has taken control of the production side.”

Sarco have three furnaces with capacities of 22 tons each, one 5 ton, one 3 ton and one 12 ton unit giving the company a combined capacity of 20 000 tons in a year.

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The size of the casting is evident in this picture

The gyratory crusher full ring spider cast by Sarco. It is the biggest steel (BS3100 A2) casting Sarco has made since entering into the general engineering castings sphere. The casting was made in the newly enlarged 7.8m x 7.8m pit, with a pouring weight of 55 tons using a tandem pour method

Machining of the gyratory crusher full ring spider
The foundry has six coreless induction furnaces with a total capacity of 86 tons. The company can manufacture castings from 450 kilograms up to 85 tons.

"Initially when we introduced the concept of manufacturing heavy engineering castings into the foundry, all of these castings were done in the same pits and floor space as the mill rolls. Experience taught us that we had to separate the departments and now the general engineering castings department has its own pits, which have been upgraded, and floor space."

"Additionally, we have ramped up the skills of the staff in this department with an emphasis on those that are on the foundry floor. They have advanced methoding courses and others on foundry practices."

"Our predictive metal analytics software is also used in the casting process. The software determines the liquid metal solidification morphology and quality. Sarco is ISO 9001:2015, ISO 14001:2015 and OSHAS 18001:2007 accredited. The Quality Assurance department has strict procedures for planning, manufacturing, testing and document control."

This expansion into heavy engineering castings has afforded Sarco, along with the help from a team comprising of Sarel van den Heever (Project manager of Spares, Supplies & Services), Peter Pienaar (Director of Spares, Supplies & Services), Albie van der Walt (specialist consultant), SP van der Walt (Sales and Marketing Manager of Sarco) and Ettiene Boshoff (methods engineer at Sarco), the opportunity to produce the "gyratory crusher full ring spider".

It is the biggest steel (BS3100 A2) casting Sarco has made since entering into the general engineering castings sphere. The casting was made in the newly enlarged 7.8m x 7.8m pit, with a pouring weight of 55 tons using a tandem pour method.

With the help of methods engineer Ettiene Boshoff and a specialist consultant, a solid casting with almost no upgrading required was achieved. The casting has an OD of 5.2m x 1.3m in height and will be exported to Europe.

Sarco MD, Harold Pretorius, said: "Strategically the decision was made to expand our general engineering casting division and this casting is an important step in the right direction."

Spares, Supplies & Services

Amongst the parties involved in the project were the highly respected Spares, Supplies & Services (SSS Group of Companies). SSS have been specialising in crushing equipment for more than 20 years and since inception, they have successfully repaired most major components on cone, gyratory and jaw crushers. As far as possible, all components are restored back to original and OEM specifications to ensure compatibility with spares available from OEMs. Welding, heat treatment, NDE testing and machining stages are monitored and documented to ensure sound and acceptable engineering practices. Mechanical repairs of components up to 20 ton capacity can be handled, but for larger components, such as the gyratory crusher full ring spider, outsourcing is necessary.

Everything is manufactured from approved drawings and material specifications as per the OEM specifications. Quality requirements as per the manufacturing processes are strictly adhered to and certification issued as required. SSS has also diversified over the years in terms of the products and components repaired or manufactured. SSS are not just limited to crushers and now have experience with a number of other heavy duty equipment. SSS is now working with Sarco to produce castings with improved delivery times, reduced upgrading cycles and improved methods.

A comment from the customer: "This is one of the cleanest castings we have seen in the 20 years we have been specialising in crushing equipment. It is not every day that you get a casting of this complexity with such a small amount of upgrading."

Ascast

Ascast, established in 2020, is a foundry and machine shop specific consulting company that brings together a combination of industry experts in order to be a complete foundry and engineering industry consultation group. Ascast specialises in casting materials, methods, refractories, patterns and processes for both foundry and engineering companies and is run by specialist consultant Albie van der Walt.

For further details contact Sarco on TEL: on 016 910 7000 or visit www.sarco.co.za
Policy directive on the exportation of ferrous and non-ferrous waste and scrap metal extended for two years until July 2023

This is despite the submission from the Metal Recyclers Association (MRA) requesting that the Minister reject the recommendation to extend the PPS while the export duties are in place.

Ebrahim Patel Minister of Trade, Industry and Competition has announced through a statement in Government Gazette No. 44758 of 28 July 2021 that the policy directive on the exportation of ferrous and non-ferrous waste and scrap metal extended for two years.

"By virtue of the powers vested in me in terms of section 5 of the International Trade Administration Act, 2002 (Act No. 71 of 2002), I, Ebrahim Patel, Minister of Trade, Industry and Competition hereby notify as follows:

a) On 10 May 2013 the Minister of Economic Development (the Minister) issued a Trade Policy Directive to the International Trade Administration Commission of South Africa (ITAC) in terms of section 5 of the International Trade Administration Act No. 71 of 2002 on the exportation of ferrous and non-ferrous waste and scrap metal and subsequently reviewed and extended the Policy Directive

b) On the 17 December 2020 in Government Gazette No. 44008, the Minister extended the Policy Directive for a further period of 7 months until 31 July 2021 to allow for work by the South African Revenue Service (SARS) to bring the export tax on ferrous and non-ferrous waste and scrap metal into operation in terms of any applicable taxation law and consideration by the department and ITAC on which aspects, if any, of the Policy Directive may be continued in order to complement and support the operation of the export tax on ferrous and non-ferrous waste and scrap metal

c) On 9 February 2021, industry stakeholders adopted the Steel and Metal Fabrication Masterplan 1.0 (the “Masterplan”). The Masterplan provides a blueprint for growth and renewal in the steel and metal fabrication industry. As part of the Masterplan, a working group on scrap metal, involving key stakeholders from across the industry, was established to determine which, if any or all, of the Policy Directive should remain following the commencement by SARS of the export tax on ferrous and non-ferrous waste and scrap metal. The working group has recommended to the Minister that the Policy Directive be extended for a further long-term period to provide policy certainty for the downstream beneficiation industry

d) In Government Gazette No. 44758 of 24 June 2021 stakeholders and interested parties were invited to submit representations and comments regarding the proposed extension of the Policy Directive from 31 July 2021 until 31 July 2023 following the recommendation from the working group on scrap metal taking into account the recently adopted Masterplan for the steel industry

e) Following consideration of the matter, the aim of the Masterplan for growth and renewal of the steel and metal fabrication industry and comments received, I hereby extend the Policy Directive issued to ITAC in terms of section 5 of the International Trade Administration Act, 2002 for a period of two years from 31 July 2021 to 31 July 2023."

MRA’s response to the proposal to extend the Price Preference System (“PPS”) on ferrous and non-ferrous scrap metal for a further two years

On 8 July 2021 the Metal Recyclers Association submitted a long and detailed submission to Dr Umeesha Naidoo, Director: Primary Minerals Processing, Department of Trade, Industry and Competition outlining why the proposal to extend the Price Preference System (“PPS”) on ferrous and non-ferrous scrap metal for a further two years should not be implemented.

In its introduction the MRA says: "Any decision by the Minister of Trade Industry and Competition (‘The Minister’) to extend the PPS on ferrous and non-ferrous scrap metal, in conjunction with export duties on these materials, is unreasonable, irrational and arbitrary. Any such decision is legally challengeable."

The MRA then documents many reasons and concludes with:

1. The proposed extension of PPS for another 2 years is based on the recommendation of an anonymous working group, who are either working with incorrect and/or incomplete information or who have the requisite information and are choosing to withhold this from the Minister. Any decision which flows from this compromised recommendation is by its nature irrational as soon as the Minister becomes aware of the compromised status of the recommendation. Following this submission, we believe the Minister is now aware of the problems with the recommendation and should consequently reject the recommendation

2. The MRA requested a seat on the Council and this request was denied or ignored. The errors made in the Masterplan and the consequent recommendation of the
On 14 July 2021, the South African Revenue Service (SARS) published an information notice on a new export duty on scrap metals.

In 2020, export duty on scrap metals was introduced in the Customs and Excise Act (1964), (the Act). The duty on the exportation of scrap metals will become compulsory for imported, locally obtained or manufactured scrap metal effective, 1 August 2021. As of this date, certain ferrous and non-ferrous waste and scrap metals will be subject to an ad valorem duty rate. The implementation of the export duty on ferrous and non-ferrous waste and scrap metals replaces the current Price Preference System, which was introduced to improve the availability of domestic scrap.

The export duty applies to exports to all countries, barring those that benefit from exemptions, under trade agreements that South Africa is party to.

What is the objective of export duty on scrap metal?

The objective of export duty on scrap metal is to provide foundries and mills with better access to higher quality and more affordable scrap metals in the local market. In turn this will result in the mills and foundries becoming more competitive cost wise and also attracting investments, creating employment and supporting industrialisation. It will also ease the pressure brought upon by unfair trade practices within the domestic metals industry.

Where can I find the rates of duty on scrap metal?

Schedule No. 1 Part 6 of the Schedule to the Act (the Tariff), see Schedules to the Customs and Excise Act, 1964 – South African Revenue Service (sars.gov.za).

For more information, email Exportdutyscrapmetals@sars.gov.za.

Export duty rates


MRA’s request to suspend the imposition of the export tax

The Metal Recyclers Association have submitted request to keep the export duty on scrap metal at 0% from 1 August 2021 in light policy reversal by the Minister of Trade, Industry and Competition (DTIC) Ebrahim Patel. The document can be read in full at: https://mra.co.za/wp-content/uploads/2021/06/2021-06-29-LTN-MRA-Request-to-Suspend-the-Imposition-of-the-Export-Tax-o.._.pdf

The new export duty on scrap metals is effective 1 August 2021
One of South Africa’s largest foundries – Amsted Foundry Solutions SA – has recently manufactured and delivered the third casting for an order of four similar castings for a local company that supplies product to the power and steam generation industries, amongst others. Referred to as a yoke casting that is used as the feed head for a ball mill the casting eventually has a nett weight of 30 tons.

“45 tons of medium carbon steel are cast for this large component that the foundry pre-machines and heat treats before delivery to the customer. The casting then goes through final machining and further testing before being transported to site for assembly,” said Amsted Foundry Solutions SA’s Foundry and Melting Manager Armandt Jacobs.

“The order for the four castings is a revival of a contract that we were last contracted to do in 2013. This is quite significant for this section of the foundry as we seek opportunities to replace orders that have been reduced in certain areas of the rail transport industry,” continued Jacobs.

“The cast products division of Scaw South Africa was purchased by Amsted Rail Company Inc in March 2018 and operated under the name Cast Products SA before changing its name to Amsted Foundry Solutions SA in July 2019.”

Amsted is a US-based company, ultimately a wholly-owned subsidiary of Amsted Industries Incorporated. Amsted Industries is a diversified global manufacturer of industrial components serving primarily the railroad, vehicular,
construction and building markets. Cast Products SA was a company incorporated by the Industrial Development Corporation of South Africa (IDC), to which the cast products division of Scaw South Africa (Pty) Ltd (Scaw) was transferred, prior to the implementation of the transaction.

Precision rail castings

Amsted Rail is one of the world’s leading designers and manufacturer of undercarriage and end-of-car railcar components. Amsted Rail manufactures and markets heavy-haul equipment worldwide. The company offers “Adapter Plus” steering pad systems, axles, bearings, brakes, centre plates, coil springs, couplers, connectors, knuckles, drawbars, cushioning units, draft sills and draft gears, friction shoes, hatch covers, plastic pellet gates, “Preload Plus Constant Contact Side Bearing”, truck assemblies, wear prevention products, and wheels. It also provides IONX, an asset monitoring solution that tracks fleet from anywhere in the world. The company was incorporated in 1977 and is based in Chicago, Illinois, USA.

Amsted Foundry Solutions SA is a manufacturer and supplier of single piece thin walled locomotive and passenger car bogie frames, freight car components and high integrity cast steel railway wheels to the local and international railway markets. Amsted Rail in the USA was a client of the local company, prior to the purchase of the South African business. Amsted Rail’s involvement in South Africa began around 2003 and the company continues to make investments to expand their capabilities in the region.

Amsted Foundry Solutions SA comprises three separate foundry sites, all of them based in the Gauteng province and is one of the largest foundry groups in the Southern Hemisphere. There is the original foundry operation in Germiston, the Eclipse East Foundry that specialises in low alloy steel and high chromium iron mill liners, manganese crushing wear parts for gyratory crushers and jaw crushers and low alloy steel earthmoving under carriage wear parts and the Boksburg Foundry that manufactures a complete range of manganese mill liners, screens and grids used in the gold mining industry.

The Germiston foundry is one of the largest foundries in the South Africa and produces castings with a finished weight of up to 30 tons. The complex where the foundry is housed is universally known as Union Junction, a 49-hectare site that has been operational since 1942. History shows that the company was established in 1924 when it began operating from a location in Eloff Street Extension in Johannesburg in 1924 before moving to the Germiston site. By 1956 it had become a leading supplier of cast steel bogies.

The foundry holds the American Association of Railroads’ approval for the manufacture of freight car side frames, bolsters and cast steel wheels. Other products include large gear segments, high-carbon, high-chromium, abrasion resisting coal grinding elements for coal-fired power stations.
high-chromium iron mill liners and impact crushing parts, stainless steel coiler drums, and a range of slag ladles for the metal processing industry.

Arc furnace melting units with 20 ton and 12 ton capacity and a 25 ton capacity ladle vacuum degassing unit serve the foundry where steels can be produced with lower sulphur, nitrogen, oxygen and hydrogen contents, particularly necessary for the manufacture of high strength, low-alloy steels.

This extensive foundry network enables Amsted Foundry Solutions SA to streamline production of a wide variety of products, including large girth gear segments, large high chromium iron coal pulverising wear parts, mill liners, slag pots, locomotive frames, bogie castings, couplers and drawgear as well as cast monoblock railway wheels. Products included in the large girth gear segment include high carbon, high chromium and abrasion resisting coal girth gears. Girth gears are cast in either one piece, halves, quarters and occasionally in fifths. Each individual segment may weigh between seven and 25 tons.

Germiston Union Junction Works – Jobbing foundry

The Germiston facility of Amsted Foundry Solutions SA is also known as the Union Junction Works. This facility comprises a number of units. Besides the specialist foundry manufacturing rail freight wheels there are a further two foundries and a machine shop on site.

The major activities of the second foundry, which is known as the jobbing foundry, are to manufacture single piece thin walled locomotive and passenger car frames and freight car components, high chrome white iron grinding rings, balls, clypebs and other large castings such as the yokes and spiders that are also used in the power generation industry.

Locomotive bogie frames manufactured of cast steel far exceed that of fabricated frames. Locomotive bogie frames are manufactured for all track gauges with axle loads from 15 000kg to 40 000kg.

Other products manufactured include undercarriage parts for various mining shovels such as crawler shoes/track pads, drive tumblers, idlers, rollers, high chromium iron mill liners and impact crushing parts, stainless steel coiler drums and a large range of slag pots and ladles for the minerals processing industry. Amsted Foundry Solutions SA also designs and manufactures cone and gyratory crusher wear parts in a range of materials including bowls, mantles, concave segments, torch rings and jaws as well as blowbars/hammers, impact plates and wear plates.

The jobbing foundry has three distinct bays. The heavy bay accounts for the manganese castings that weigh 12 ton and up such as the yokes, bowls, mantles, concave segments, torch rings and jaws that are cast in a variety of austenitic manganese steels from standard 11-14% manganese grades to 23% manganese and various molybdenum and chromium bearing grades as well as martensitic alloy steels. Manganese castings account for up to 60% of the heavy bay output.

The medium bay foundry accounts for the locomotive bogie frames that the company is well-known for. Cast steel locomotive frames permit optimum metal distribution with smooth structural transitions. Stress concentrations are minimised and a high strength-to-weight ratio unit is produced. The service life and reliability of cast steel far exceeds that of fabricated frames. Cast locomotive bogie frames provide an integral, rugged frame, which supports the locomotive under all service conditions and provides a secure mounting for auxiliary equipment.

The fabricated type bogie has a frame that is constructed of various components (flat bar, plate, angle, channel, section, etc.) and are usually either welded or riveted (or a
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The combination of both) while the cast type has a frame of steel that is cast as a single piece including both side frames, horn cheeks, and the main cross member or bolster. Bogies consist of a number of fixed and moving parts depending upon the construction type.

Depending on usage a bogie frame can weigh between 4 tons and 8 tons. The company has also produced thousands of sets of steel castings for freight cars for both the local and exports markets. These include side frames and bolsters.

The third bay will account for the lighter castings such as the crusher balls that the foundry manufactures for Eskom and other customers around the world. Large hollow balls needed by the E-type mills have been made typically of alloy steel but more recently high chrome balls are becoming more popular.

Apart from the successful chrome-molybdenum steel balls, Amsted Foundry Solutions SA now offers both solid and hollow balls in high chrome iron. Today the hollow ball production process covers diameters up to 1 150mm. Each size ball is gauged to a typical tolerance of ±2.5mm.

The foundry holds the TPG accreditation for special processes such as castings, welding and NDT (Nondestructive testing) and American Association of Railroads accreditation to manufacture locomotive bogie frames. Other accreditations include ISO9001:2008, ISO14001:2009 and BS OHSAS 18001:2007.

All of the foundries are serviced by in-house machine shops, which include vertical and horizontal boring mills, computer numerical controlled (CNC) machining centers, lathes and planers. Castings of 25 tons and five metres in diameter can be produced to close tolerances. Smaller castings that require CNC batch production runs are also accommodated. The machine shop is also fully equipped to handle up to the largest grinding element castings which are 4 260mm in diameter and weigh 14 metric tons.

“98% of castings manufactured by Amsted Foundry Solutions SA that require machining are done in-house. We cannot accommodate the large yokes that we have just done and these are sent to an independent,” said Jacobs.

“Rail transport is coming back into favour for the transportation of goods over long distances. Through the pandemic orders from the local SOE have not been what we are used to but this could change in the near future as efforts are made in the local industry. This will also be beneficial for our third foundry located in Germiston, which we refer to as our high-volume foundry. In 2016 the company commissioned a new R150 million high-volume moulding line at this foundry, manufactured by Omega Foundry Machinery.”

“However, our international recognition in bogie frame manufacture has seen us secure a very encouraging order from GE Transportation in the USA. We are required to manufacture between two and four of them a week and with a nett weight of 6.6 tons each this has added a bit to our production figures.”

“Well-known trains, including South Africa’s famous luxury Blue Train, are hauled by locomotives that are fitted with Amsted Foundry Solutions SA bogies. Scaw manufactures railway products for both electric and diesel-electric locomotives.”

“With the increase in demand from China for both coal and iron ore Transnet Freight Rail is under pressure to get the commodities to the ports for shipping and therefore need those GE Transportation diesel-electric locomotives working on the rails. This will obviously be very beneficial for our foundries,” concluded Jacobs.

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Celebrating the life of a skilful patternmaker – Johann van der Walt

It is with deep regret and sadness that we announce the passing of Johann van der Walt (74) in July 2021. Johann was well-known to many in the foundry industry for his skill and expertise when manufacturing patterns. Born on 30 November 1946 in Germiston, Gauteng Johann grew up in an underprivileged environment. His father Koos, a boilermaker who was employed by Scaw Metals, was a tough man but he still tried his best to provide for his wife Sarah and eight children and give them happiness and opportunities. From the age of five Johann, his older brother Jan and younger brother Koos were expected to help and work on the plot that they lived on, in the form of growing small crops and providing food for the family as well as milking the two cows that the family owned. Johann never regretted this experience even though it was a hard one, but as he said, it was a good upbringing that taught life lessons necessary. He was a craftsman and was very proud of the fact. The patterns he has made in his lifetime are too numerous to count but the attention to detail that he took was something that he would remind us of.

Johann started his work life in foundries at Sangus Engineering as an apprentice patternmaker. Some years later Johann, older brother Jan and wife Letitia started their own patternshop, Star Patternmakers.

“A perfect name because that is exactly what they were. Well-known and large companies such as Sulzer Pumps, KSB Pumps and Envirotech also knew this and placed their business with the company. Soon Dad and uncle Jan were so busy that they grew from strength to strength,” said Vincent.

“It was not all easy for them though. The economy of South Africa has always been tough and volatile and as a result in 1988 they formed Knights Sales so as to not rely entirely on the income from the patternmaking.”

Johann’s brothers Koos and Jan would pre-decease him and in 1999 he handed over the reins of Knights Sales to his children. This was Johann’s dream from a young age and he gave his children his full support. The knowledge he passed to his children daily, has made the foundry a big success.

Patternshop and patternmaking

“Dad has been working with his hands and wood all his life and he continued to so right up until he became ill. When you visit the patternshop you can see the expertise and experience oozing from the man. It was too late in life for Dad to convert to CNC machining but in this case it was not necessary. He was a craftsman and was very proud of the fact. The patterns he has made in his lifetime are too numerous to count but the attention to detail that he took over every new pattern was always evident,” continued Vincent. Eduard Johann van der Walt passed away on the afternoon of Tuesday 20 July 2021, after a 5-week battle with COVID-19 and the damage that the virus had done to his body. He fought as hard as he always did in life. Johann’s legacy will live on indefinitely and his family will always recognise him as the fuel behind the fire. As a husband to Letitia, father to Vincent, Cobus and Belinda, a father-in-law, an Oupa to five grandchildren, a friend and colleague, Johann will be missed by all who knew him. RIP to a loving and gentle man.
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Two of South Africa’s larger foundries have recently become linked as a result of a recent B-BEEE deal for one and the acquisition of the other one by a private equity firm that has a 25.1% stake in the first one. Sounds confusing but it is not if you read on.

In a recent Competition Commission announcement the Commission has unconditionally approved the proposed merger whereby South African Industrial Group (Pty) Ltd (SAIG) intends to acquire South African Roll Company (Pty) Ltd (Sarco).

SAIG is owned by Medu Industrial Partnership. Medu IV GP, also going under the name of Medu Capital, has investments in Weir Minerals Africa Proprietary Limited, which provides mill circuit technology, slurry handling equipment and services and ground engaging tools to the natural resources markets. Medu IV GP also has interests in Secutel Technologies Proprietary Limited, which provides security technologies and services to the banking, telecommunications and retail industries.

Medu Capital is a South African-based private equity firm. Mineral solutions provider Weir Minerals Africa’s (WMA’s) South African operation, Weir Minerals South Africa (SA), is now 25.1% owned by black empowerment partner Medu Capital.

Sarco operates a steel foundry and machining operation that produces steel rolls and sleeves and are used by first-tier global steel mills in the production of flat and profiled steel.

Sarco is based in Vanderbijlpark, Gauteng and services mainly the global market with considerable sales being exports. The rolls manufactured by Sarco vary in size, shape and metal composition depending on the needs of the primary target firm’s customers. Rolls are used by customers to shape heated steel into various products such as hot rolled coils or plates or profiled long products such as railway tracks, I-bars and H-bars.

Sarco has long been recognised as one of the leading international manufacturers of castings used in the steel and non-ferrous manufacturing industries. Producing castings weighing up to 65 tons requires the foundry to have large melting capacity and the machine shop to have custom-built CNC equipment. All the processes in between pouring of the metal and final machining have to match and accommodate the size and weight of the castings - no mean feat.

The Commission found that the proposed transaction is unlikely to result in a substantial prevention or lessening of competition in any relevant markets. The Commission further found that the proposed transaction does not raise any public interest concerns.

Medu Capital already had a 35% stake in Sarco having acquired the stake in 2008.

Hudaco has presented interim results to the end of May 2021 that look spectacular when compared to its prior period numbers. It is pointed out that those were mired in hard lockdown period, creating a distorted picture. The interim results for the 2019 financial year are far more comparative as a ‘normal’ trading period.

Against its half-year results for 2019, Hudaco’s revenues grew 6.5%, margins expanded, seeing gross profit rise 9% and operating leverage rallied resulting in operating profits increasing 20%. Group sales at R3.4 billion for the half year are up 6.5% on 2019. Operating profit increased to R357 million, with an operating margin of 10.6%, a very respectable number for the first six months, which includes all the major holiday periods.

Hudaco Industries is a South African group specialising in the importation and distribution of high-quality branded automotive aftermarket, industrial and electronic consumable products mainly in the southern African region.

Hudaco businesses serve markets in the automotive aftermarket, power tool and fasteners, data networking, battery, security and communication equipment, bearings and belting, electrical power transmission, diesel engine, hydraulics and pneumatics, specialised steel, thermoplastic fittings and filtration businesses supply engineering consumables, mainly to mining and manufacturing customers.

There are 18 businesses that make up this segment. They include Dosco Precision Hydraulics, foundries Gear Pump Manufacturers and Joseph Grieveson and Engineering Technology Services.

Not only is the group’s top-line growth encouraging, but the lean operating structure has seen this growth affect its bottom line. The company has seen a strong recovery in the domestic mining, automotive and manufacturing sectors.
Crime gangs have stolen dozens of truckloads of copper owned by miners and traders including Glencore, Trafigura and Traxys this year as they were heading to ports in southern Africa, three sources with direct knowledge of the matter said in various Reuters reports.

Record high copper prices have triggered an increase in hijackings in recent months in Botswana, the Democratic Republic of Congo, South Africa, Tanzania and Zambia, said the sources who declined to be named due to the sensitivity of the matter.

The South African Police Service told Reuters that the matter was being investigated, but declined to give further details. Glencore declined to comment. Trafigura said it did not comment on security issues. Traxys did not respond to requests for comment.

Copper mined in Zambia and Congo, which accounts for about 10% of global supplies estimated at 24 million tons, is transported to ports across southern Africa. A total of 66 trucks carrying copper were robbed between January and May this year and 60% of the hijackings occurred in South Africa, one of the sources said.

With the average truck carrying between 32 and 34 tons of copper cathode, the thefts would amount to roughly US $21 million worth of copper at current prices. More trucks were stolen in June and July, according to the source, who did not provide figures for those months but said one truckload of the copper stolen on July 9 was worth $470 000.

Organised crime gangs melt down copper to remove serial numbers and other marks of ownership, and then resell it locally or transport it by truck to be sold in neighbouring countries, two sources said.

Copper prices hit an all-time high above $10 700 a ton in May thanks to a rebound in global demand, including in top consumer China, as manufacturing activity ramped up and economies reopened after Covid-19 lockdowns. Currently at around $9 700, prices of the metals used widely in the power and construction industries have climbed more than 50% over the past 12 months.
Different views on chrome ore tax

While South Africa continues to try to manage what is proving to be the most challenging wave of the COVID-19 pandemic, the chrome beneficiation industry is facing some significant challenges and needs key protection through the implementation of an export tax on raw chrome ore.

A recent statement by Save SA Smelters points out that government’s sluggish adoption of a taxation on the export of raw chrome ore is costing the country an estimated R15 billion in taxable income based on the exported ore tonnages from 2020.

Export tax key to unlocking dormant ferrochrome smelting capacity, says lobby group

Various local newspapers and news outlets report that mining representative group ChromeSA and ferrochrome lobby group Save SA Smelters remain at odds about the proposed implementation of a chrome ore export tax. ChromeSA in a statement on July 7 maintained that “destroying another industry” – referring to chrome ore producers – is not a solution to the challenges faced by ferrochrome smelters.

Save SA Smelters on July 8 responded by pointing out that India (through a 100% tax imposed on chrome ore exports) and Indonesia (through a complete ban on nickel ore exports) protected their value-add industries with great success, and question why this should not happen in South Africa.

Cabinet has previously released a statement in which it said it had approved of measures to support the domestic ferrochrome industry, including through a proposed export tax on chrome ore.

Save SA Smelters claims that chrome mining companies are often focused on gains at the expense of thousands of South Africans who have already lost their jobs. The organisation says it represents at least 17 000 people who have lost their jobs owing to the continued closure of smelters across the country.

More concerning is the fact that – according to Save SA Smelters – government’s slow approach to the implementation of this tax is putting an estimated 3 000 jobs at immediate risk and between 8 000 to 9 000 downstream jobs at risk.

This would have a devastating impact on the chrome mining industry, which would have to cater for global demand with a smaller workforce.

Dwindling beneficiation

Since 2005, there has been a dramatic change in the ratio of alloy produced to ore produced in South Africa. Save SA Smelters says the ratio has fallen from 0.32 tons alloy per ton ore to 0.18 ton alloy per ton ore in 2019.

Between 2005 and 2019, about 95 million tons of the ore produced in South Africa was not processed into ferrochrome. Assuming 10% of chrome ore is used for non-ferrochrome applications and based on a 2.3 ton of ore per 1 ton alloy requirement, this is equivalent to about 37 million tons of “lost” ferrochrome production in South Africa.

All the while, Chinese stainless steel production capacity has grown from 8.6 million tons in 2008 to 30.7 million tons in 2019. This increased demand for ferrochrome fuelled a rise in exported ore from South Africa, especially upper group two as a by-product from platinum group metal producers.

This dramatic growth in Chinese production caught the major ferrochrome producers in South Africa by surprise and they were unable to keep pace with the necessary expansion – in part owing to lengthy environmental-impact-assessment procedures.

Adding to this difficulty was the start of energy constraints in the wake of load-shedding. This helped China’s ferrochrome smelter industry to grow bigger than that of South Africa. Projections indicate that there will be an increase in ferrochrome demand of about 2.5-million tons over the next seven to ten years, of which a critical mass will come from outside of China.

“Any demand outside of China will have to be sourced from the regions with chrome resources – South Africa and to a lesser extent Kazakhstan,” Save SA Smelters highlights. The organisation adds that it is unlikely that ore will ever be processed exclusively in South African facilities, but the intent must always be to process as much as the local resources will allow.

Significant value

The cornerstone of South Africa’s economy has long been its rich abundance in minerals and its ability to beneficiate these minerals before exporting them to international customers. In 2019, the mining sector contributed approximately R226.2 billion to the country’s GDP.

According to Charmane Russell, spokesperson for the Minerals Council South Africa, the value added by the beneficiation of minerals in South Africa is quite significant.

“About 94% of South Africa’s cement is made locally from locally mined products. 83% of South Africa’s steel is made locally from locally mined iron ore, chrome, manganese, and coking coal,” she says.

“Around 30% of the country’s liquid fuels are produced from locally mined coal, as is 85% of its electricity. Most of our domestic chemicals, fertilisers, waxes, polymers, plastics, are fabricated using locally mined minerals and coal. Finally, 8% of the world’s platinum catalytic converters are produced locally,” adds Russell.

She says the Minerals Council estimates that beneficiation adds around R500 billion in overall commodity sales value. In addition, it estimates that more than 200 000 jobs are created in the downstream beneficiation industries.
South Africa signs plan to support R600 billion steel industry

South Africa has signed a plan to support the country’s steel industry, the Department of Trade, Industry and Competition has said.

The Steel and Metal Fabrication Master Plan agreed by the government and stakeholders in the industry that contributes R600 billion to GDP “provides a blueprint for the industry to re-energise itself and expand production,” the department said in a statement posted on its website.

The plan comprises six priority areas, including addressing supply and demand-side measures and agreements related to the African Continental Free Trade Area, the world’s biggest free-trade zone, the department said without giving details. An oversight council made up of 35 members of industry, labour groups and public sector officials has been set up to drive its implementation, it said.

The master plan for the steel and metal fabrication sector - an initiative by regulators, industry and labour - outlines steps to re-energise the sector and expand production, the ministry said.

South Africa is one of the largest steel producers on the African continent. South Africa’s only steel producer is ArcelorMittal South Africa, which is majority-owned by Luxembourg-based ArcelorMittal.

The industry has faced mounting pressure with fewer local infrastructure projects, high input costs and global price competition.

“The signing of the master plan sets the foundation and commitment for the development and growth of this important sector,” the ministry said in a statement.

The plan’s priorities include addressing demand and supply, the African Continental Free Trade Area Agreement (AfCFTA) and a steel fund to support industry projects.

It’s not just South Africa’s chrome ore that China loves, it also loves South Africa’s coal and iron ore

The booming Chinese economy is sucking in massive amounts of South African exports as it needs our mineral exports such as coal and iron ore to fuel its economy, according to Helmo Preuss (an Economist at Forecaster Ecosa) in an opinion piece in Business Report.

According to the latest data from the General Administration of Customs of China, South African exports to China showed an 83.2% year-on-year (y/y) surge in the first quarter of 2021 to $15.89 billion (about R230 billion), while South African imports from China grew by 52.4% y/y to $9.43 billion, resulting in a trade surplus in South Africa’s favour of $6.46 billion.

China’s economy sustained a steady recovery in the first half of the year, with the production and demand booming, while employment and prices remained stable, the National Bureau of Statistics said. It added, however, there were concerns about the global spread of the pandemic and unbalanced recovery domestically. In the first half, the economy grew by 12.7% y/y, due in part to base effects as it was measured against last year’s coronavirus-triggered slump.

Among sectors, the primary industry rose by 7.8% during the first six months of the year, the secondary industry increased by 14.8%, and the tertiary industry grew by 11.8%. From a South African perspective, the secondary sector is the most important, as that is the sector that sucks in our exports. This is reflected in the strong growth of 15.9% y/y in Chinese industrial production in the first half.

South Africa is not the only beneficiary of a booming Chinese economy, as the total trade value between China and Africa grew by 41.9% y/y to reach $116.89bn in the first half of the year.

Similar to South Africa’s growth rates, China’s imports from Africa grew faster than its exports to Africa, but unlike South Africa, the balance was a surplus in China’s favour. China’s exports to Africa grew by 38.2% y/y to $66.79bn, while China’s imports from Africa increased at a faster pace of 47.1% y/y to US$50.1 billion, resulting in a trade surplus in China’s favour of $16.78bn.

When viewed through the prism of South African data, the foreign trade balance with China was a deficit of R11.6bn in the first five months, which is the latest available data from the South African Revenue Service.

The difference between the Chinese and South African data is the cost of transport. The System of National Accounts states that imports are valued at the landed cost, while exports are “Free on Board”, in other words once they are loaded onto the ship but excluding the cost of transport. Ordinarily, the cost of shipping is a small percentage of the total cost, but this year there has been an extraordinary rise in the cost of shipping a container around the world. This is, in part, due to a shortage of containers. As world trade is booming with a 25.3% y/y surge in global trade volumes in April this year, according to the CPB. This is 5.2% higher than April 2019 and has resulted in shipping companies such as Maersk scrambling for containers.

China’s economy boomed this year as it is the world’s factory, churning out products such as masks or exercise equipment for housebound consumers. Demand for its products have not slowed even as the rest of the world economies reopened, so exports surged by 32.2% y/y in June.

The increase caught many economists by surprise, as one of China’s biggest ports was partly closed for most of last month and China’s exports of medical supplies have begun to level off, so the consensus forecast had been for a slowdown to 23% growth from May’s 27.9 % y/y increase.

Port and shipping delays are driving the price tags for Chinese goods even higher in foreign markets such as South Africa. The cost of shipping a 12m cargo container from China to the US has soared from the usual $4 000 to $5 000 per container to a record $18 000 or more this month.

Similar increases are evident in the shipping rates between Chinese ports and South African ports. Shipping rates for containers have continued to rise steeply in the days since Yantian Port reopened last month.

The high shipping costs are widely expected to remain for the rest of this year as stores around the world scramble to restock inventories depleted by stronger than expected demand, as well as starting to prepare for the Christmas shopping season.
used electronic devices have been recycled in a nationwide effort to produce the Olympic medals for the Tokyo 2020 Games. The project plans to set a precedent for future Olympic Games.

There’s no more prestigious athletic award than Olympic gold, and at the Tokyo Olympics, the top competitors will take home medals with surprising origins. This year’s gold, silver, and bronze Olympic and Paralympic medals were produced from recycled small electronic devices like cell phones.

Over a span of two years, the Tokyo 2020 Medal Project collected 78,985 tons of electronic devices, including 6.21 million cell phones, from across Japan to produce the 5,000 Olympic medals that will be awarded in Tokyo. The gold, silver, and bronze elements of the devices were obtained through smelting, a process that involves heating and melting to extract a base metal.

As the athletes take to the podium and, with a slight bow, have their medals placed around their necks, they will be happy to have placed in the top three. For the people behind the Tokyo Medal Project, they’ll be happy that those Olympic medals are there in the first place. For the people of Japan, the project offered a unique opportunity to be a part of the Games.

“The campaign called on the public to donate obsolete electronic devices for the project. We are grateful for everyone’s cooperation,” said Tokyo 2020 spokesperson Hitomi Kamizawa.

The project capitalised on the fact that billions worth of precious metals such as gold and silver, which are used in electronic devices, get discarded each year globally thanks to people simply dumping or burning their gadgets instead of ensuring they are properly collected and recycled.

A recycling supply chain

“There was a two-year national effort in Japan to collect enough recycled material to produce the 5,000 bronze, silver, and gold medals for the 2020 Tokyo Olympics. Up to 90% of Japanese cities, towns, and villages participated by setting up donation pick-up sites where hundreds of thousands of Japanese citizens donated their old electronic devices. The recycling campaign produced 32,kgs of gold, 3,500kgs of silver and 2,200s of bronze. All from nearly 80 tons of small electrical devices such as old phones and laptops,” said Kamizawa.

Although recycling efforts like these often seem straightforward, the medal project had to engage the national government, thousands of municipalities, companies, schools and other local communities. One of the primary companies involved was the Renet Japan Group whose business philosophy revolves around sustainability.

“We developed a waste management movement for the medal project with the cooperation of many stakeholders, from the Japanese government to local communities,” said Toshio Kamakura, a director of the Renet Japan Group.

“When the project was launched in April 2017, there were just about 600 municipalities on board. By the end of the project in March 2019, that figure had risen to more than 1,600. There was a major public relations campaign, and collection points were set up to make it easier for the people to contribute,” said Kamakura.

Collecting the used devices was just the first step. Following
a process of dismantling, extracting and refining by contractors, the recycled material was then moulded into Junichi Kawnishi’s design concept, a design that beat out 400 other entries in a competition held by Tokyo 2020.

The bigger picture

While the Japanese will be the first to have all of the Olympic medals made out of recycled material, the concept is not new. In the Rio 2016 Olympic Games, 30% of the sterling silver to make the gold and silver medals were obtained from recycled materials such as car parts and mirror surfaces.

Looking ahead to the Paris Games in 2024, where social change and enhancing the environment are among the main themes, there are hopes that the Tokyo 2020 Medal Project will set a precedent.

When it comes to the environmental aspect Kamakura thinks it is necessary to continue in order to build a more sustainable material society.

A record 53.6 million tons (Mt), or 7.3 kilograms per person of electronic waste, equivalent to 350 cruise ships the size of the Queen Mary 2, was produced globally in 2019, making it the world's fastest-growing domestic waste stream, according to the United Nations. E-waste has surged by more than a fifth in the past five years amid growing demand for electronic gadgets, mostly with short life cycles and few options for repair.

Less than a fifth of the scrap ends up being properly collected and recycled, posing serious environmental and health risks.
Newly patented manufacturing process of a tungsten alloy enables additive manufacturing of complex components

Single-phase material bonding allows precise control of the composition.

Cast aluminium, tool manufacturing and radiation shielding.

Tungsten alloys (WNiFe / WNiCu) are used because of their corrosion resistance against molten metal and high thermal conductivity for chill-mould casting processing of aluminium. Yet, also in tool manufacture and for shielding from alpha and gamma radiation, the heavy metal with its density comparable to gold is indispensable. However, at around 3400°C, tungsten has the highest melting point of all chemical elements and is therefore very difficult to work with, as well as due to its Mohs hardness of 7.5.

As a result, components with more complex shapes, such as curves or conical bores, often have to be switched to hot-work tool steel, which is easier to form. In order to enable the use of tungsten for those more demanding geometries and thus to increase the efficiency and longevity of the components, Bayerische Metallwerke GmbH, which belongs to the Traunstein-based Gesellschaft für Wolfram Industrie mbH, has developed a new manufacturing process for the tungsten alloys WNiFe and WNiCu and patented it in early 2021. This is characterised by the fact that the multi-phase mixed crystal alloy is obtained in a powder form that is suitable as a starting material for 3D printing and coating processes.

“Due to its resistance to corrosion and erosion from molten metals as well as its excellent thermal conductivity, tungsten is the material of choice in the field of cast aluminium,” says Nabil Gdoura, research and development engineer at Bayerische Metallwerke GmbH. “The very high density of 19.25g/cm³ in its pure form also makes it a good alternative to the harmful lead, which is still possible.

Otherwise, the material quality of the end product can be adversely affected by the formation of cracks. Such precise and sometimes curved shapes are impossible to model from the hard heavy metal, whose extremely high melting point is between 3387 and 3422 °C, using conventional machining or forming processing techniques. Therefore, for these complex components for the purposes mentioned, it has so far been necessary to switch to hot-work steel, which can be brought into almost any desired shape with the help of 3D printing techniques.

New tungsten alloy in powder form suitable for 3D printing

After completing the two-year development phase, Bayerische Metallwerke applied for a patent for their new manufacturing process for a tungsten alloy product and its further use at the beginning of 2020, which was finally granted in January of this year.

“The special feature of our tungsten-nickel-iron alloy is that we obtain it in the form of a pre-alloyed powder,” explains Dr.-Ing. Hany Gobran, research and development manager at Bayerische Metallwerke and inventor of manufacturing technology. “This is suitable as a starting product for 3D printing and coating processes.”
Get Inspired!

TaeguTec cutting tools remove the stress of manufacturing in order to create reliable products.
Diecasting has earned considerable attention from industrial designers in recent years, regarding finished products and consequently production systems. This is mainly the outgrowth of those designers’ efforts to develop lighter versions of standard products, in automotive manufacturing most obviously. Those efforts led to the development of structural castings and drivetrain parts designed in aluminium alloys, for volume production. High-pressure die-casting is adopted to manufacture parts that might otherwise be produced by sand casting or investment casting, often to be followed by extensive finish machining and assembly. HPDC makes it possible to produce highly detailed but lighter engine and drivetrain components, lighter structural parts, and possibly to eliminate some post-production steps.

The next turn in this tale involves systems for producing those parts, and the recent emergence of super-sized machines to produce lightweight die-castings of expanded dimensions.

And both of these ongoing trends will leave some asking: What else can die-castings do? Germany’s Fraunhofer Institute for Manufacturing Technology and Advanced Materials (IFAM) opened a new research operation in Wolfsburg, Germany, to address that question, but there the focus is on low-pressure die-casting.

Low-pressure die-casting accounts for a much smaller proportion of all die-casting operations than HPDC. Typically, it is applied for alloys with low melting points (e.g., aluminium alloys) and parts weighing up to 150kg. The advantages of LPDC are that it can form very high-strength parts with complex geometries and excellent dimensional accuracy. Solid castings with thick walls are typical applications, such as light-alloy automotive wheels, but also some chassis and drivetrain components and housings.

IFAM’s LPDC foundry is intended to host applied research projects, with conventional melting and casting capabilities for aluminium but also higher-temperature melting, for example for copper alloys. This multi-functionality is possible thanks to both direct and indirect induction melting and a “crucible quick-change system.” It can melt standard metals (aluminium, copper, brass, bronze, magnesium, or steel) as well as non-metallics, like salt mixtures.

Currently, salts are a medium being studied for “lost core” processes using HPDC to develop hollow castings, like engine and battery housings. IFAM suggests its new foundry could be a centre for researching salt cores in low-pressure die-casting.
The new foundry’s furnace is a 110 litre, 130 kW vessel for melting at up to 1 650°C, with casting pressure up to 1.0 bar. The 1 310mm by 1 290mm lower mounting surface can accommodate moulds weighing up to 3 500kg. The upper mounting surface of 1 200mm by 1 200mm allows a maximum clamping force of 60 metric tons.

A vertically movable furnace chamber allows free accessibility of the melting crucible, for quick alloy changes. In addition to the flexible processing of different melts, the plant can work with conventional steel moulds, as well as sand or semi-moulds.

Fraunhofer IFAM also has invested in a Kurtz AL 16-12 LPDC system, to be commissioned later this year.

The new plant concept was developed in collaboration with TEGISA Giessereianlagen und Industrieöfen GmbH, based on a prototype in operation at Fraunhofer IFAM in Bremen since 2015.

Examples of research to be taken up by IFAM include composite casting for integrating metallic structures and profiles (aluminium or steel) directly into a casting; combining low-pressure die-casting with non-metallic primary or forming processes (e.g., sheet metal forming or plastic injection moulding); or producing cast rotors for electric drives, generally a product of high-pressure die-casting.

The capabilities adopted by IFAM indicate a new range of growth possibilities for LPDC. This article first appeared in in the Foundry Magazine.

ASK Chemicals launches ASK Online Academy

ASK Chemicals, a foundry chemicals and materials supplier, has launched its ASK Online Academy programme on 30 June 30 2021. With ASK Online Academy, ASK Chemicals offers the foundry industry an additional channel to gain in-depth expert knowledge and the latest insights into its solutions in foundry chemistry, feeding technology and metallurgy.

ASK Online Academy can be seen as a virtual spin-off of ASK Casting Academy, an in-person event. Participants in the online programme have access to 30 to 45 minute sessions that focus equally on knowledge transfer and dialogue with ASK Chemicals experts.

Interested parties can find an overview of the upcoming webinars and register on the website: www.ask-chemicals.com/ask-online-academy

Website offers comprehensive knowledge and information

“Especially in the last few months of the pandemic, we have seen big changes in media usage patterns and information procurement.”

“Web offerings have generated an unprecedented level of interest. ASK Chemicals is supporting this trend and has recently launched new product finder tools on its website that help customers discover the product solutions they are looking for," said a company spokesperson.

The ASKtheExpert platform on ask-chemicals.com offers additional value and is an exciting opportunity to further engage with ASK Chemicals experts. The offer is complemented by an extensive pool of expert knowledge in the form of white papers, manuals, and technical papers.

With these new and valuable offerings, ASK Chemicals is giving the global foundry community a gateway to valuable expert knowledge, up-to-date product knowledge and first-hand information on leading innovations.
The emergence of larger and more complex die-cast parts calls for novel lubricants that support the latest generation of die-casting machinery.

“The expanding scope of automotive emissions regulations is pressuring automakers and their suppliers, one result of which is designers and manufacturers’ focus on ‘light-weighting’ new vehicles. Their goal is to reduce overall vehicle weight to improve fuel economy and range by introducing a growing number of hybrid and electric vehicles,” says Mark Cross, the global business development director for die-casting at Quaker Houghton.

“To achieve overall vehicle-weight reduction, engineers are adopting a range of materials and production techniques to create lighter components for powertrains, drivetrains, and structural systems. This use of new materials - including aluminium, carbon fibre composites, high-strength steel, magnesium and titanium brings a need to re-think traditional manufacturing and assembly processes and embrace new technologies and techniques.”

“For die-casting in particular, engineers must consider how to improve product quality and productivity for large and complex parts. Alongside this, production costs need to fall, the total cost of ownership needs to be reduced, and the environmental impact of the die-casting process must be lowered.”

A shift towards larger die-cast parts

“The automotive industry is no stranger to automation, with many production lines already embracing Industry 4.0 standards. Physical and digital processes are increasingly intertwined as they aim to create smarter, more efficient production sequences. And still the pressure is on to combine production efficiency with those lighter materials.”

“Die-casting of course is a critical manufacturing process for the auto industry, to form parts such as engine blocks and transmission cases. Now, the technique is being adapted to cast one-piece structural parts like shock towers and torque bars, supporting those light-weighting goals. Tesla has drawn much attention for its stated goal of producing a unitary, die-cast underbody structure to replace a combination of multiple welded and stamped components.

This requires using the world’s largest die-casting machine to produce such a large casting - a change that could revolutionise automotive design and production.”

“The benefits of die-casting are well known to automakers: it’s a quick and relatively economical process that offers the repeatability required by mass production, meaning identical parts can be produced from one mould.”

“The move toward engineering a vehicle structure from a smaller number of large die-cast parts rather than high volumes of smaller parts reduces production complexity and offers significantly reduced costs. Casting larger parts stands to remove as many as 70 steps from a more traditional production process, and while the benefits are clear the casting of larger parts brings complexity to the die-casting process.”

“To avoid compromising quality and increasing costs in the manufacture of large, complex components, specifying the correct die lubricant technology is essential to ensure an adequate release lubricant film is formed over the die surface.”

“As die tools increase in size and complexity, they become increasing difficult to lubricate using conventional water-based lubricant systems. Ensuring lubricant reaches all parts of the complex tool to prevent casting failure is a significant challenge, not easily overcome.”

Lack of penetration of the lubricant spray into areas such as ribs, coupled with the low film forming capabilities of water-based lubricants is a real challenge for die-casters. Additionally, the spray heads used to apply water-based lubricants are simply too large, bulky, and inflexible to deploy lubricant successfully to all areas of the die face.

“For an industry looking to cast larger components and maintain product quality, improve productivity, and reduce costs, water-free electrostatic lubricant systems like Quaker Houghton’s like Lubrolene provide a solution. Such systems combine a high-power release agent, free from the drawbacks of conventional lubricants, coupled with a compact low weight spray system.”

“Switching from traditional water-based lubricants to a water-free electrostatic solution allows die-casters to produce larger components with higher process temperatures, while meeting the challenges of maintaining product quality, improving productivity, and reducing costs.”

The model Y Tesla replaces 70 underbody parts with one casting
Now you CAN put all your eggs in one basket...

...we’ve got it covered

A True One-Stop Provider
Our customers enjoy the advantages of a one-stop-shop for their casting needs. This guarantees fast response times, reliability and cost effectiveness in the development and marketing of new and existing products. Among other things the broad product range includes resins for all curing processes, binders, coatings, additives, filters, release agents and metallurgical products. We offer an ambitious product promise as well as reliable delivery. For you, our customer, this means security and continuity for your product requirements. That is what we stand for, we are particularly flexible in adapting our own specialised technological expertise to new or unusual customer requirements.

Contact us today to discuss your specific foundry needs and allow us to give you the competitive edge.

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In a joint tailoring project, Japanese ceramics expert AGC Ceramics Co. and voxeljet AG have qualified the high-performance ceramic material Brightorb for 3D printing. In addition to potential applications in the production of structural components and works of art, the material is particularly suitable for 3D printing of highly complex moulds and cores for metal casting.

Brightorb was developed on a VX1000 with a build volume of 1,000mm x 600mm x 500mm. The 3D printing system works layer-based and bonds the ceramic particles with an inorganic binder. Targeted applications for the new, ceramic material set include high-performance cores for sand and investment casting, ceramic filters, structural components, as well as art and product design.

The ceramics material with its brand name Brightorb is composed of spherical sand with the main components aluminium oxide (Al2O3) 80%, zirconium oxide (ZrO2) 10%, silicon oxide (SiO2) 9%, the minerals corundum, baddeleyite and kinds of cement. During 3D printing, Brightorb is applied to the build platform with average grain sizes of 50µm and layer thicknesses of 100µm and selectively bonded with an inorganic binder. The inorganic binder is characterised by its high environmental compatibility as only water vapor is produced during moulding. This greatly improves environmental and working conditions in foundries.

To subsequently prepare the printed ceramic for the final application, the printed components get impregnated by a silica-based liquid and have to be fired in a sintering furnace for their final strength. Most of the unprinted powder can be reprocessed, recycled and fed back into the printing process.

“We have been noticing a growing demand for increasingly complex component geometries among our customers for a long time,” explains Dr. Ingo Ederer, CEO at voxeljet. “The great advantage of the geometric freedom of 3D printing is, that geometric adjustments can significantly optimise the efficiency and effectiveness of, for example, engines or turbine wheels. It is rare that such complex components can still be produced using conventional moulding processes. Together with AGC, we have been able to optimise a VX1000 for ceramic powder in close cooperation, so that it is ideally suited for the challenging demands of metal casting. Both in terms of strength and surface quality,” says Dr. Ederer.

The 3D printed ceramics are used, for example, as cores for the investment casting process in order to reproduce complex and filigree cavities within castings. In this process, the filigree cores are combined with conventional wax patterns. These are coated with a ceramic slurry and burned out before casting. What remains is a hollow ceramic mould in which the printed core is still inserted. Molten metal is then poured into the mould. After cooling, both the mould and the core are removed.

Mr. Ushimaru, Additive Manufacturing Director from AGCC is also satisfied: “Brightorb is a high-performance ceramic that is extremely well suited for metal casting due to its high-chemical stability, heat resistance, thermal conductivity and low thermal expansion. We were able to optimise the material set in such a way that the shrinkage factor of the printed components during the downstream sintering process at 1,400°C is less than one per cent. This means that the components are also suitable for filigree core designs. Thanks to the high-fire resistance, it is possible to cast alloys with melting points beyond 1,600°C. Overall, ceramics will continue to gain importance as a material in the future, and the same applies to 3D printing as a manufacturing technology. We are pleased to have embarked on this path together with voxeljet and look forward to further close cooperation.”
Two German firms, 5-axis vertical machining center manufacturer Wenzler (Heller group) and workholding equipment specialist Roemheld, have developed a process that allows a casting or other component to be secured ready for machining, while at the same time checking it for accuracy of form and position before machining starts. It avoids adding value to defective workpieces that will later be scrapped, increasing process reliability, raising productivity and lowering production costs.

The idea was conceived by Wenzler, which wanted to be able to offer its customers, particularly in the automotive industry, turnkey production centers for the reliable machining of aluminium chassis and suspension components, 24/7.

The company’s technical manager Sebastian Knaus says: “We wondered in early 2019 how workholding technology could contribute to making our customers’ production even more stable and efficient.”

Already familiar with Roemheld’s workholding equipment, which he describes as sophisticated, reliable, and sturdy, he contacted the Friedrichshütte supplier’s key account manager Benjamin Nagel.

Development of the innovative clamping technology was based on a cast aluminium rear axle frame secured in a test fixture in Wenzler’s technical centre in Spaichingen. The pilot phase ended in spring 2020 and this year it will be used for the first time to assist the series production of aluminium structural components at a German automotive supplier.

The innovative concept is based on swing clamps from Roemheld with integrated pressure sensors able to detect the accuracy of the workpiece about to be machined cost-effectively and easily. The intelligent clamping technology checks the parts for defects and contour variations, detects fixturing errors and provides information on the position of the component and the applied clamping forces during machining.
Toyota Industries Corporation and Siemens cooperate on digital transformation for die-casting

AI predicts abnormalities in aluminium die-casting products.

To support their goal of manufacturing quality parts, Toyota Industries Corporation and Siemens have cooperated to develop artificial intelligence (AI) that can predict product abnormalities in aluminium die-casting, a key process in automotive air conditioning compressor production.

The development is one of the world’s first to use defect prediction AI for die-casting. It improves quality and productivity by utilising the AI application in Industrial Edge, the Siemens edge computing platform for industry. The initiative is an innovative example of digital transformation in manufacturing, and Toyota Industries Corporation aims to use it to further evolve their technology and incorporate it into their production plants in Japan and overseas. Siemens hopes that more businesses in the manufacturing industry will adopt their digitalisation and automation solutions such as Industrial Edge.

The die-casting process is challenging to manage due to a range of constantly changing production conditions such as variations in the molten aluminium temperature or the injection rate. Success relies on the judgement of experienced workers, and sometimes the parts require secondary processing to handle abnormalities and maintain high quality standards.

40 000 data points per die-casting shot

During development, the two companies used a Siemens Simatic S7-1500 controller to gather big data totalling approximately 40 000 data points per die-casting shot at the model line and then analysed the data using AI technology. They succeeded in preventing defects and improving quality by monitoring the production status in real time and automatically predicting equipment abnormalities that lead to quality issues. The production data is processed by the defect prediction AI on Industrial Edge, enabling instant analysis of the data on production conditions at the time of a shot and assessment of the part quality immediately after the casting. This series of AI technologies boosts productivity, improves quality, and transforms how operators work.

Aluminium die-casting is a high-speed moulding process in which molten aluminium is shot into a die at high pressure. It is ideal for the accurate manufacture of metal cast parts that demand high dimensional precision, and therefore is often used for automotive parts that require high-quality and reliability. The aluminium die-cast parts made at the Toyota Industries Corporation production plant in Obu, Japan, have excellent airtightness and high pressure resistance. They are essential for the high-quality Toyota Industries Corporation compressors used in automotive air conditioning, a field in which they proudly hold the largest share of the global market.

Siemens aimed to contribute to operational improvements with Siemens Industrial Edge, while Toyota Industries Corporation aimed to increase quality and productivity. The alignment of these goals with the die-casting process led to this development, during which they demonstrated proof of concept across two years and achieved a successful outcome. Based on this result, they will continue pursuing technological advancements in order to provide better products for their customers throughout the world.

“Digital transformation is a game changer. I am delighted to have the opportunity to partner with Toyota Industries Corporation in this revolutionary endeavour and to work together to forge the future,” says Rainer Brehm, CEO of Factory Automation, Siemens AG. “We will continue to develop and provide solutions for industries incorporating the latest technologies and to contribute to optimised and sustainable manufacturing.”

“It is significant that Toyota Industries Corporation has successfully implemented AI technology and achieved outcomes in the die-casting process, which is where important compressor parts are produced. I am also proud that we have contributed to the practical use of Industrial Edge, the Siemens edge computing platform for industry,” says Yuji Ishizaki, Senior Executive Officer, Member of the Board and General Manager of Compressor Division, Toyota Industries Corporation. “We will continue to offer new value for customers and to pursue even better working methods by embracing the use of advanced digital technologies in the production field.”
RAPID THREAD MILLING
WITH HIGH-END PERFORMANCE

- top performance thread milling up to 1300 N/mm²
- up to 50% reduced cycle time
- increase in tool life by up to 100%
- reliable machining and even higher process safety
With the project “EasyTitan”, the Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM in Dresden has launched a project for the rapid and process-reliable manufacturing of light-metal components in aerospace. Together with the space management of the German Aerospace Center e.V. (DLR), filament-based metal printing processes are to be optimised under reduced gravity conditions.

The aim is to develop additive manufacturing processes for use in space. In order to minimise the use of equipment and consumables and the associated costs, developments are focusing on the further development of a hybrid process chain for the simple production of titanium components. At the beginning of this chain is the additive metal printing process Fused Filament Fabrication (FFF), which has already proven its suitability in the aerospace industry. The plastic moulds created here are then filled with a metal powder suspension in a controlled manner during a gel casting process to mould components. Finally, they can be compacted into fully-fledged metal components during a heat treatment process (sintering).

Central to this is the use of the light metal Ti-6Al-4V, the processing of which is to be qualified as a gel casting suspension. In addition, the influence of various gravity conditions on the manufacturing process is to be investigated with the aid of accompanying simulations. This will lay the foundation for new concepts for defect-free and simple filling of printed moulds. The expected results of the project are manifold. For the gel casting suspension, a recipe for Ti-6Al-4V powder will be developed, the simulation tool for the design of filling processes will be created, and the elaborated processing and handling concept for the Ti-6Al-4V suspension will be developed.

In the field of heat treatment, the results will be used to create a catalogue of requirements for a minimum furnace concept for space.

In the future, the results should also be usable in further projects on casting processing and heat treatment. Even though “EasyTitan” is designed for space travel, the results are equally conceivable for terrestrial applications. Examples include solutions for the production of design studies, prototypes and small and medium series. The reason for the wide range of potential applications is that the process combines the advantages of a low investment volume with simple and fast processing and yet achievable high surface quality.

In addition to the manufacturing route via gel casting used in the “EasyTitan” project, direct metal printing via the filament-based approach is also being pursued at Fraunhofer IFAM in Dresden.

LK Group introduces the world’s first 9 000T giant die-casting machine

Two years after the world’s first 6 000T die-casting machine was launched by the LK Group the company has achieved another remarkable milestone this year by building the world’s first 9 000T machine. The new model is named Dreampress and the clamping force is 9 000 tons, which is the largest die-casting machine in the world.

In December 2019, LK Group launched the world’s largest 6 000T ultra-large intelligent die-casting unit to the market. It provides the solution to reduce the parts from 70 to 1 by one shot, which has brought a disruptive impact and profound technological change to the new energy automobile industry and 5G communication industry.

In early 2021, LK built the die-casting machine series DREAMPRESS 9 000T, expanding the range of products in the whole industry chain which capable to produce bigger automotive parts. The 9 000T machines are completely assembled in the LK Group factory and are ready to dispatch to the customers.

It has a technological breakthrough that differentiates from the traditional toggle-based and toggle-free machines, which have higher performances and wider application ranges, to fully meet the needs of large-size single piece casting production for the automotive industry. It provides a solid foundation for the sustainable development of the die-casting industry.

The launch of the Dreampress 9 000 ton die-casting unit is the start and milestone from the emerging trends development. LK has participated in several national projects jointly creating a new trend in the sustainable development of the foundry industry. The aim is to continue to develop better products for the industry and contribute to the development of the manufacturing industry to become bigger and stronger.
The latest Tesla earnings call reveals a tenfold increase in net income, meaning Tesla made over one billion dollars after expenses. The company also continues to produce at capacity, amid persisting global challenges and record demand for electric cars.

Tesla reported $1.14 billion in (GAAP) net income for Q2 – the first time it has surpassed $1 billion. This is among a revenue of $11.96 billion, mostly made by selling cars. Overall automotive revenues amounted to $10.21 billion, of which only $354 million came from sales of regulatory credits – less than in any other year.

Tesla’s impressive increase in margins over the last quarter and over the last year was made possible by three main factors and one minor factor, according to Tesla CFO Zach Kirkhorn: Cost optimisation (major), cost reduction plans (major), increased volumes (major) and pricing (minor).

While some think Tesla will work hard to keep high margins, we must always remember the mission is to “accelerate the world’s transition to sustainable energy,” not to become the world’s most valuable company. These high margins mean that Tesla has the freedom to lower prices in certain regions to take or preserve market share, without endangering the health of the company. Of course, a better situation for the company is if the following levers can allow Tesla to continue to sell every car it makes and Tesla won’t have to reduce prices more than its costs decline and trim margins.

Levers

Bring back the Standard Range Model Y as they are still needed in the US and Europe, but Tesla has already released the Standard Range Model Y in China.

However, the use of large castings to massively reduce costs and simplify build complexity (in addition to many other innovations, including battery innovations) is a major lever. Tesla confirmed that the Model Y in both Texas and Berlin will have both the front and the rear castings as a single piece (as opposed to the Fremont and Shanghai Model Ys that only have a rear casting). Tesla also shared that the Model Y will use 4 680 cells in a structural battery pack, but that they are also preparing a way it can use the older cells in a non-structural battery pack as a backup. Tesla is learning to have several alternatives available, just in case plan A materials suddenly become unavailable or their supply becomes unexpectedly constrained.

The use of lithium iron phosphate (LFP) batteries will cut another $2 000 from the low-end Model Y’s cost. Elon gave further support using this demand lever. He mentioned that two-thirds of Tesla’s vehicles and virtually all of its stationary storage could use iron-based batteries because of the increased capability of newer LFP batteries. It seems the shortages of so many parts are pushing Tesla to more aggressively move to materials that are widely available today.

New Texas plant

There’s a saying in Texas that everything is bigger. New details about Tesla’s manufacturing plant just outside of Austin, known as Giga Texas, reveal that everything really is bigger in the Lone Star State, and Tesla is on its way to having the largest automotive manufacturing facility in the United States.

CEO Elon Musk detailed yesterday that the upcoming manufacturing plant just minutes outside of Austin will be “almost a mile long when complete,” making it so large that you likely have to see it to believe it. The automaker is nearing initial production at the plant, which is scheduled for later this year.

However, Giga Texas just may have the size to displace the massive Kia plant, putting it into second place if Musk’s calculations are true. After purchasing an additional 155 hectares of land adjacent to the already 850 hectares Tesla owned, the company is already planning to set its most advanced facility on the largest piece of land that a factory sits on in the country. 1 005 hectares will outfit the estimated 158 000 square metres that the main structure will sit on. The second facility will be an additional 84 000 square metres, with the final building tacking on another 93 000 square metres, swamping the Kia facility with an estimated 335 000 square metres of manufacturing floor space for Tesla to roam around on, a million square feet larger than the Georgia plant.
Grinding Techniques – a trusted partner to the foundry industry

The foundry industry has undergone a major transformation in recent years, yet despite the stagnation in steel and iron casting it is generating steady growth with more than 100 million tons.

Meanwhile, non-ferrous metals such as aluminium and magnesium alloys are increasingly coming into focus with foundries servicing an extremely diverse range of markets. Automotive manufacturers account for approximately 55% on the ferrous side and over 84% on the non-ferrous metal casting side with the second most important customer sector for foundries being general machine construction with around 40 different industry segments.

Innovative developments in cast lightweight components for electromobility and the requirement for improvements in thermomechanical properties demand constant growth and flexible adaption of the cutting and grinding processes.

Grinding Techniques, a company of the Tyrolit group, provide cutting and grinding solutions through seamless monitoring of the manufacturing process, from the raw material to the finished end product, this enables us to produce consistently high tool quality and at the same time increase the process stability with the growing degree of automation for cutting and grinding applications.

Cut-off grinding for removing risers and sprues

Cut-off grinding is the most frequently used process for removing risers and sprues. Owing to its high efficiency and productivity, cut-off grinding is used in many areas of cast iron and steel production.

Locally manufactured Superflex cut-off wheels impress with exceptional longevity and an attractive price-performance ratio. Our special production processes and comprehensive safety testing ensure maximum work safety and minimum noise levels during application.

When it comes to fettling, high demands are placed on the ergonomics and performance of hand-held grinding tools. All our Andor rough grinding wheels are manufactured to deliver the best high-performing results in every rough grinding application.

Grinding Techniques’ range of pendular grinding wheels ensure that fettling work can be performed with reduced exertion and higher stock removal rates. In this type of machining, one of the greatest challenges is vibration during application. Through intensive and ongoing development, Grinding Techniques are able to supply product into the market with significant reduced vibration levels enabling operators to work more efficiently. Working with an angle grinder is one of the most important processes in foundry sectors for machining all types of metals. When it comes to grinding large and heavy components, Grinding Techniques recommends the use of cup wheels, as they are exceptionally robust and durable. The composition of the cup wheels makes them suitable for large area machining of welding lines as well as fast material removal.

When working with cup wheels, it is particularly important to ensure that cup wheels are used only on angle grinders with diameters of 178mm. Smaller machines tend to rotate too fast, while larger ones rotate too slow. In addition, a special protection cover is required to ensure sufficient levels of working safety.

Straight grinders are always in high demand when precise results are required for difficult-to-access areas. Their versatile application options make them a popular tool.

Superflex

Grinding Techniques’ vitrified and resin bonded Superflex mounted points offer you solutions for the highest quality requirements. The wide range of applications also requires ceramic points that strike a perfect balance in terms of chip performance, surface finish and longevity. Ceramic points are often used in foundries and mould making.

Apart from versatile mounted points, Grinding Techniques also stock a range of tungsten carbide burrs that are made from tried and tested, high-quality cemented carbide types on the most modern CNC grinding machines. Grinding Techniques’ Superflex tungsten carbide burrs are used on a wide range of handheld, pneumatic and electric machines as well as on industrial robots. Thanks to their versatility, they can be used on a variety of materials. To provide a solution at hand for the full spectrum of applications, Grinding Techniques offers a wide selection of premium quality tungsten carbide burr shapes. The range easily meets the general demands of economic efficiency, high stock removal rates, simple handling and excellent longevity. Grinding Techniques has been the preferred precision grinding partner for decades. With constant innovation, development and research, we are able to offer a complete bespoke abrasive solution to suit your application.

All Grinding Techniques’ products are manufactured and tested in accordance with International OSA and ISO Standards.

For more info contact Grinding Techniques on TEL: 011 271 6400 or email info@grindtech.com or visit www.grindtech.com
Online research is a key part of the industrial buying cycle, particularly during the consideration and selection stages. castings sa Online is where buyers search, research and learn about new product technology and new process innovations. Aligning your message with the areas where prospects are likely to look for technical solutions is the essence of contextual advertising and brand development.

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Morgan Advanced Materials is highlighting the consequences of aluminium contamination, as it continues to make strides in the development of two specialist coatings, designed to act as a diffusion barrier during the melting process. Although aluminium is often alloyed with other metals and elements to give the exact mechanical and chemical properties for each application, contamination and impurities caused by chemical reactions with crucibles can affect the overall microstructure of the material post melting.

As explained the presence of impurities and inter-metallic compounds in aluminium melting can reduce the overall ductility of aluminium materials, as well as causing dislocation. The quality of castings is often significantly affected by metal impurities, causing an increase in rejection rates. As the automotive industry continues to favour aluminium where reduced weight is significant for emission control, it is important to ensure that as pure a material as possible is created. The industry is becoming highly competitive with cost pressures mounting every day. This means factors such as higher casting quality, reductions in rejections, and improved crucible life are making a big difference to cost competitiveness.

Morgan’s answer to this is its PRO and STAR coatings, which have proven particularly effective in reducing impurities in aluminium alloys, preventing contamination of material, and dross build-up in the crucible. These specialist formulas can be applied to the interior surface of a crucible to help prevent chemical reactions between the metal and the crucible, acting as barrier to reduce impurities. PRO coating is relatively simple to apply. It can be mixed with water and applied to the crucible with a brush by a trained manual labourer. It also acts as a mortar, to repair areas that have been damaged or chipped, to maximise crucible life.

STAR coating is more advanced and gives superior results for clay-bonded as well as carbon bonded crucibles. It must be applied by a skilled supervisor using a specific spray gun to form a nano-particle scaled layer inside the crucible. It then needs to be sintered under specific conditions to ensure a strong bond. The result is a reduction of cleaning time, and significantly purer metals than those produced by standard crucibles.

Morgan’s PRO and STAR coatings are the result of our expertise in material science, our knowledge of application engineering, and our focus on the requirements of end users. This has enabled us to offer a superior product to customers. We have also boosted our capacity for these in-house, enabling us to serve mass markets where aluminium is increasingly being more heavily adopted, such as automotive and aerospace.

For further details contact Keegor Meltech on TEL: 011 421 0711 or Eddie Short on 082 460 1593.

The development of the Foseco FEEXDEX sleeves

The need for high modulus spot feeders continues to increase as a result of the development of more complex cast parts, with more isolated sections having no direct feed path, the increased mechanical requirements and more stringent as cast specifications and growing pressure to reduce casting production costs, by maximizing casting yield and minimising post casting operations such as fettling.

A specific requirement of spot feeders is a high modulus to volume ratio. Feeders are required to provide long solidification times, but contain at the same time only small amounts of feed metal. The development of the FEEXDEX recipe balances the exothermic characteristics to ensure the correct graphite micro-structure formation in ductile and vermicular iron alloys. The consistent performance of FEEXDEX is assured by comprehensive tests of incoming raw materials and finished product.

The most critical requirement for FEEXDEX sleeves is the quick and easy application onto the pattern plate. A range of application technologies has been developed which allow the foundry to introduce FEEXDEX sleeves without negatively impacting moulding line productivity.

The poster below shows the available range for FEEXDEX K, HD V and HD VS sleeves.

For more information contact Foseco South Africa on TEL: 011 903 9500 or visit www.foseco.com
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