Foundries should play joint role to reclaim sand

Foundries have long desired to reduce total cost of sand, including purchase cost, freight cost and disposal cost. While purchase cost of sand has gone up, freight cost too has risen drastically. Some foundries not only pay up for loading & unloading discarded sand, but have to shell out its dumping fee as well. Environmentally too, it is becoming more and more difficult to dispose of great quantities of material into the ground.

In recent years the foundry industry has been showing an increased interest in reclamation of system sands. Recently, a sand reclamation unit, being set up by the government as part of its Kolhapur foundry cluster project, helped the industries in the vicinity get rid of waste sand.

The Kolhapur foundry cluster is a special purpose vehicle (SPV) established at an estimated cost of Rs 42 crore. It has received 90 per cent of the total project cost from the Union government’s share. The remaining 10 per cent will be received by the cluster once the project starts to roll on. Funded almost entirely by the government, it will be interesting to see whether it will actually have any positive economic impact.

In theory, though, it sounds a great idea. We can foresee many issues and concerns with mixing sands of different binder systems which will not be immediately apparent, but could stop a foundry in its tracks.

“The Japanese have done collective sand reclamation for decades very successfully. But it’s all the same sand, and all shell sand. Beautiful fluidized bed to burn off the resin, and reclaim the heat in re-coating the sand,” says Mike Swartzlander, the US-based foundry strategist.

In addition, the cluster has appealed industries to get registered for the sand reclamation plants. Industries are expected to pay charges to use the plant. Talking about the collaborative efforts required by small, medium and large foundries, Subramanian R, Director, Plant Operations, Robot Components Pvt Ltd, remarked, “We have common water treatment plants at tanneries established by the government, and now we have a common effluent plant at Himachal Pradesh, but everybody has to contribute, based on his daily outflow.

(found on pg. 13)
72nd World Foundry Congress held in Nagoya, Japan

The 72nd World Foundry Congress was held between 21st & 25th May'16, held in Nagoya, Japan’s third largest metropolitan region located on central Honshu. Nagoya is known as one of the centers of the manufacturing industry and also for its famous historical castle. More than 900 official delegates that include 300 international delegates attended the Congress. The exhibition Japan Foundrex 2016 took place as well where all foundry supplier companies participated.

Technical Sessions were held during 22nd to 24th May’16 with over 150 technical papers, 44 poster presentations from a selection of leading Industrialists and Academics.

Vinod Kapur, Past President-World Foundry Organization (WFO), chaired the technical session on ‘Mold and Core making Technology’ where total 5 papers were presented. Reinhard Stötzel was the co-Chairman during the session.

Vinod Kapur, Past President-WFO & IIF attended WFO General Assembly meeting on 24th May’16 as IIF Official delegate. During the meeting, Ravi Sehgal, Past President-IIF, was elected to the WFO Executive Council, representing India for year 2017.

On 25th May, a work-visit was specially organized for WFO Executive Council Members by Hiro Kimura to his company, Kimura Group, a well-known foundry for Full Mold Casting Process.

In addition, a gala banquet and foundrymen’ nights was held on 23rd and 24th May respectively, which provided the delegates with an opportunity to socialize whilst networking with colleagues from around the globe.

Kirloskars honours Vinod Kapur

Vinod Kapur, Past President, World Foundry Organization (WFO) & Executive Chairman, Gargi Huttenes Albertus Pvt Ltd, was felicitated by Kirloskars during their dealer conference held in Bangkok, on May 29, 2016, for his outstanding contribution to foundry industry and successful completion as President of World Foundry Organization, UK. At the event, a silver plaque was presented by Aditya Kowshik, Managing Director, KPC to Vinod Kapur with a citation ‘Thanks for keeping India’s Flag flying high’. 
The five-member BRICS nations cover 29.6 per cent of the world area, and 42.3 per cent of the world population. In 2013, the five countries accounted for 21.3 per cent of the world GDP and 16 per cent of the world foreign trade volume. Their contribution to the global economic growth has been more than 50 per cent in the last decade. As the world economic integration develops and the BRICS economic cooperation is becoming deep and concrete, the communication in the foundry industry of BRICS nations has become more frequent.

Until now, BRICS casting production accounted for more than 60 per cent of the world, playing a more and more important role in world foundry industry. The 6th BRICS Foundry Forum was held in Beijing, China on 16th May, 2016. Theme of this Forum was “Status of Foundry Industry and Co-operation Projects”.

Each country (except Brazil, who was absent) made presentation during the event. From India Past President Vikas Garg, briefly provided the current scenario of foundry industry of India.

Subodh Panchal, Chairman, International Affairs Committee of the IIF in his power-point presentation provided details on production, installed capacity, demand, forecast etc. of various sectors like grey, ductile, steel and aluminum die castings.

He also presented forecast of major consumer industries like passenger & heavy vehicles, trucks, tractors, railways and others.

In conclusion he made suggestions for the scope of co-operation projects between India and China, in areas including: green sand reclamation, manufacture of high pressure moulding line, ceramic sand, raw earths, titanium products, and light metal casting & composites.

The next BRICS Foundry Forum will be in South Africa.
Quality Prediction of Cast Ingots

The teeming, solidification and cooling of the ingot are simulated with the casting process simulation software MAGMASOFT.

Today, more than 90% of all steel semi-finished products are continuously cast. Ingot casting production is increadibly concentrated on special alloys and products, which can only be produced by this process and where all of the typical quality issues associated with ingots are accepted. Steel ingots are subsequently subject to further processing steps, the most important of which is forging. There is no doubt that proper quality control and cost savings throughout the whole production process are key factors for a competitive production. The quality of the as-cast ingot is the starting point for all subsequent heat treatment and deformation processing. The state-of-the-art tool to investigate and predict productivity and quality is simulation. With casting process simulation, it is possible to teem, solidify and cool a virtual ingot to predict e.g. shrinkage, centre-line porosity, segregation, inclusion, residual stresses and cracks that originate during casting. The simulated properties of the as-cast ingot can be transferred to a subsequent forging simulation in order to predict their influence on the quality of the final product.

This paper shows how the quality of a cast ingot can be predicted using simulation. Emphasis is laid on those casting defects that will affect the quality of the forged end-product. The simulation of ingot casting starts with tapping a steel melt of a given chemistry from a ladle. The teeming, solidification and cooling of the ingot are simulated with the casting process simulation software MAGMASOFT. The results of this simulation are then mapped as input to a forging simulation. The results of the integrated process simulation illustrate the future capabilities for the virtual prediction of the quality of cast ingot and forged products.

The dominating casting process in today's steel industry in terms of production is continuous casting. More than 80% of all steel semi-finished products are continuously cast. The remaining areas of application for cast ingots are to-be-forged blocks, heavy slabs and heavy blocks for seamless tubes. Although there is a decreasing need for cast ingots, they will remain a necessity for products which can only be produced through this process. Steel ingots are subsequently subject to further processing steps, the most important of which is forging. There is no doubt that proper quality control and cost savings throughout the whole production process are key factors for a competitive production. The quality of the as-cast ingot is the starting point for all subsequent heat treatment and deformation steps. Thus, it is need for a through-process methodology to predict possible defects and to optimize the whole process chain such that the best possible quality and lowest reject rate is obtained.

Most major quality problems in ingots originate from the casting process. Defects like shrinkage, porosity, segregation, non-metallic inclusions and cracks are initiated during teeming of the liquid steel and/or during solidification in the mould. There are various parameters of the casting process that can be modified in order to limit defects and, if not completely prevent their existence, reduce their number and appearance so that the product fulfills the quality specification.

It is of basic importance to monitor potential defects as early as possible in the production process. Subsequent processing like heat treatment and hot deformation can then be performed in an optimized way to achieve the best possible quality at lowest production costs. Beside the quality, there is a clear need to keep the yield of the production processes as high as possible. Issues to be mentioned are e.g. the size of the hot top, lifetime of cast iron moulds, energy savings by reduction of internal scrap rates or efficient usage of proper insulation material. These aspects are taken into account directly when casting simulation is used. The production process yield can be optimized even further if as much information as possible about the cast product is transferred to a forging analysis and optimization of the deformation process.

Casting process simulation

Casting process simulation has been applied in foundries for almost 30 years. During this time, the simulation of casting processes has experienced significant development. Particularly the simulation of steel casting is a field with a long tradition for the application of simulation. Today, casting process simulation is established as a part of daily working routines to predict casting quality in many production plants. In most cases, simulation is applied to optimize the production process. Proposed lay-offs for mould, feeders, cooling chills, the gating system and various process parameters are input into the simulation program. Afterwards, virtual casting processes are carried out in order to determine potential risks for defects and to predict material properties. The casting process can be visualized and analysed in a much more intensive and cost-saving way than would be possible with “real” experiments. Temperatures, metal velocities, flowing particles as well as the solification pattern, potential defects and also material properties can be analyzed. With the simulation software MAGMASOFT, the ingot quality can be predicted with a view on all the aspects that are discussed in this paper. To provide an example, Fig.1 shows the temperatures at one particular point of time during teeming of a 90 t ingot.

Defects in ingot casting

Shrinkage and porosity: The specific solidification pattern of ingots leads to a characteristic shrinkage appearance, see Fig. 2. There is always a shrinkage cavity in the hot top, but it has to be assured that this primary shrinkage does not extend into the block. In case of an unfavorable solidification pattern, shrinkage can also appear inside the block, far below the hot top. Dissolved gases can also influence porosity development in a steel ingot.

In many cases, problems with centre-line porosity are reported. This porosity is small in comparison to the hot top shrinkage cavity and is found along a line in the centre of the block. Porosity in ingot casting is influenced by various factors like insulating powder, hot top insulation, hot top geometry, ingot height and diameter (H/D), ingot conicity and so on. Depending on the size and position of porosity, it is possible to close them in subsequent hot deformation process, e.g. forging.

Casting process simulation can be applied to optimize the casting process to prevent porosity from being formed. If its presence is inevitable, it is of importance to transfer information about the size and position of the porosity to the deformation simulation. There, it is possible to determine the forging process parameters that are required to close the porosity or to maximize the yield of the final product.

Macro segregation

Segregation is an inhomogeneity of the concentrations of alloying elements and impurities in the steel. Macro segregation is differentiated from micro segregation dependent on the particular scale at which the concentration differences are observed. Most alloying elements are more soluble in the liquid phase than in the solid phase. Thus, the metal solidifies, alloying elements in the mushy zone (solidifying liquid-solid mixture) are rejected from the growing solid dendrites into the neighbouring interdendritic liquid. This liquid is increasingly enriched with alloying elements as solidification proceeds. On the scale of the dendrites (tens to hundreds of microns), segregation results in a non-uniform solute distribution in and between the dendrite arms. This is termed micro segregation.

The movement of liquid melt or the liquid-solid mixture during solidification lead to a spread of these micro-scale concentration differences over larger areas up to the scale of the whole ingot or parts of it.

The resulting inhomogeneities in concentration are called macro segregation. The next article will discuss dominant mechanisms for moving the liquid melt is thermo-solutal convection and demonstrate how simulation can help to optimize the ingot casting process to achieve best quality and high yield.
Brexit impact: Auto parts makers in line of fire

Britain’s decision to move out of the European Union (EU) comes at a time when the global economy is not in great shape and growth forecasts for 2016 have been marked down. ‘Brexit’, therefore, has added to the weakness, fragility and uncertainty, and not surprisingly, roiled markets.

Although Britain will remain a full member of EU for at least two more years, divorce negotiations with the European Commission could commence under Article 50 of the Lisbon Treaty soon. How soon and how much these will progress is anybody’s guess.

Brexit is unlikely to have a notable impact on GDP growth in fiscal 2017, and we retain our forecast at 7.9%, with agriculture as the swing factor. The spatial and temporal distribution of rains in July and August will matter more to domestic growth.

Further Indian companies are likely be impacted in multiple dimensions such as: demand weakness on account of potential slowdown in the EU and The UK; volatility in commodity prices; currency impact on account of the potential depreciation of the rupee, euro and the pound; translation losses for companies with significant operations in The UK and the EU; and, balance sheet impact on account of exposure to unhedged overseas borrowings.

Most vulnerable sectors

Companies in sectors such as automobiles, auto components, information technology services, textiles, pharmaceuticals, gems and jewellery, leather, and leather products are most vulnerable to changes in demand and currency value. Metal companies would be hurt by the likely downward pressures on prices and potential slowdown in demand, at least in the near-term. Sectors such as shipping and ports that are reliant on global trade will also have to grapple with lower growth and consequently lower freight rates and utilisation. Further, companies with unhedged overseas borrowings will be affected by volatility or temporary sentiment-driven weakness in the rupee.

Auto part makers under pressure, but limited impact on OEMs

Within the automobile space, component suppliers will be more adversely impacted compared with original equipment manufacturers – with the exception of the JLR business of Tata Motors. The impact on the JLR business will depend on how trade agreements between the UK and other EU countries are rewritten. On the positive side, a depreciating pound will make JLR’s exports from the UK more competitive, at least in the near-term.

Impact on exports

Around a quarter of India’s auto component exports are to Europe. The UK has a share of about 5% in overall exports. Any dampening of prospects due to economic uncertainty and depreciation of the pound would have a corresponding impact on the revenues of these companies. Furthermore, companies with plants in the EU/UK would also have to contend with translation losses. Some auto component companies with significant exposure to Europe include Motherson Sumi, Bharat Forge, and Apollo Tyres.

Price volatility, demand slump to dent metal companies

Global steel and aluminium markets are already grappling with oversupply and concerns on demand growth in China. Demand in the EU was already very weak, and the new bout of uncertainty means demand will slump further, putting downward pressure on prices and profitability of manufacturers. This comes at a time when leverage is high for many companies and some of them have significant overseas debt.

Excerpts from Crisil’s analytical report on Brexit
The companies participating in the Blue Competence initiative will continue to work in future in cooperation with customers on technical solutions that help to achieve these goals.

Throughout the world, cast iron (including grey, nodular and malleable cast iron as well as cast steel) accounts for by far the greatest share in the production of metal castings. China alone has a share of about 45% in world-wide cast iron production and is by far the largest producer of ferrous metal castings. Over the past few years, Germany has been able to maintain its position as the leading European casting producer, with a share of about 10%.

Production volumes of non-ferrous metal castings (mainly aluminium, copper, magnesium, zinc and nickel) have been growing for years. Especially aluminium casting production has almost tripled since 1995 throughout the world, while the total growth in other nonferrous metal castings has only been about 10%.

**Complex processes**

Casting processes: With modern casting processes, it is possible to produce parts that are very close to the final dimensions required, avoiding or minimising the need for subsequent machining operations. This approach allows significant material, time and energy savings. Casting processes reach high metal and mould material recycling rates.

Mould and core production: The type of bonding (physical or chemical) is a key criterion for the classification of mould and core production processes. Almost all ferrous metal castings are produced using lost or expendable moulds. In Germany, some 70% of the moulds used have a clay bond while 30% have a cold resin bond. Some 70% of the moulds used have a clay bond while 30% have a cold resin bond. In core production, the (urethane) clay bond while 30% have a cold resin bond. Some 70% of the moulds used have a clay bond while 30% have a cold resin bond.

**Energy efficiency potential**

Energy efficiency and conservation of resources are also the key challenges for the foundry industry. As the automobile industry is the main customer of foundries, these requirements are closely connected with lightweight design. Nature is the great model for lightweight design. The topology of components is optimised on the basis of bionic principles. This means that the shape of the part is optimised to provide the required strength combined with the greatest weight saving. The complex shapes required can only be produced by smart design and calculation programs. The dynamic development in the field of aluminium casting is mainly the result of the growing use of lightweight parts in the automobile industry. About 75% of all the aluminium castings produced are used in this sector. Rising energy and raw material costs provide many foundries with good reason for optimising their processes with reference to energy and resource use.

**Examples of energy & resource efficiency**

Efficient foundry technology: At all stages in the casting process, plant or process optimisation measures are already well established or available for improving energy and resource efficiency and reducing carbon dioxide emissions.

**Cupola furnace**

Key factors for the energy efficiency of a cupola furnace are as follows:

- Fuels, eg coke or natural gas.
- Iron source, eg steel or cast iron scrap.
- Fluxes and additives, eg limestone, gravel, FeS, SiC.
- Utilities, eg hot air, oxygen, carbon.

**World casting production by regions**

<table>
<thead>
<tr>
<th>Region</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoW</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>China</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>India</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Japan</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Russia</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>NAFTA</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>EU 27</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**Die-casting machine**

Die-casting machines are normally hydraulically powered. Key factors with an impact on energy efficiency include:

- The type and control system of hydraulic pumps.
- Pressure and flow control.
- Approach to the supply of hydraulic power.
- Design of piping system and hydraulic blocks.
- Leaks in hydraulic system.
- Depending on the design and age of the machinery concerned, various measures may be taken to improve energy efficiency:
  - Installation of software for automatic shut-down of hydraulic equipment that is not required for a considered time.
  - Software update for the improved delivery of hydraulic power in the machine cycle (savings of 5% to 30%).
  - Limited modifications to hydraulic system to reduce base-load consumption of machine (savings up to 5%).
  - Reconstruction of hydraulic system (savings up to 40%).
- If special attention is paid to energy efficiency during the design of a new hydraulic system, savings of up to 30% can be achieved.

**Die-casting shop**

Apart from the direct and indirect efficiency improvements that are possible in metal production and processing, the potential available in connection with the use of metal materials also need to be taken into consideration.

**Nodular cast iron**

Nodular cast iron (cast iron with spheroidal graphite) features a graphite phase in the form of spheres in the microstructure. This material offers considerable advantages for cast iron parts.

Thanks to its outstanding mechanical properties including uniform distribution of hardness and strength in the component, good workability and relatively low-cost production, this material is widely used in industry.

Of the total production of 24 million tons of nodular cast iron per year (compared with 50 million tons of grey cast iron and 11 million tons of cast steel), about 50% are used for the production of castings in the automobile industry.

Many components which were previously made from cast or forged steel or fabricated by welding are now being replaced by considerably less costly nodular iron castings. This also allows the use of lower wall thicknesses (light-weight design), an approach which saves energy and conserves natural resources.

Especially safety-relevant components such as crankshafts, camshafts, connecting rods, suspension links, wheel hubs, truck wheel spindles, axle sub-frames and pivot bearings, etc are cast from nodular iron. About 30% of the material is used for the...
production of pipes with diameters from 60 to 2400 mm by centrifugal casting.

Aluminium castings

The use of aluminium castings in automobile production offers considerable potential for weight reduction. Depending on the individual model, weight savings of up to 44 kg can be realized. If this figure is extrapolated to the total number of vehicles and the kilometres driven, it is clear that this offers vast potential for carbon dioxide avoidance and fuel savings. Similar considerations apply to highly turbo-charged engines which are increasingly being manufactured from high-performance alloys for weight saving reasons. Both the downsizing effect and the weight reduction as a result of the use of lightweight castings contribute to resource conservation and emission reduction.

Outlook

The member companies of the VDMA association Foundry Machinery offer efficient, environmentally compatible and competitive technological innovations in the key areas of:

• Energy efficiency
• Environmental protection
• Ergonomics and safety

The companies participating in the Blue Competence initiative will continue to work in the future in cooperation with customers on technical solutions that help to achieve these goals. At the European level, they are working on the definition of the best available technologies and creating global benchmarks. By offering plant designs which are both economical and sustainable, these companies are contributing to low-emission, resource-efficient casting production not only in Germany or Europe but also for customers throughout the world.

Blue Competence - the VDMA sustainability initiative

The VDMA association “Foundry Machinery” is part of the VDMA Blue Competence initiative. Our members are committed to energy- and resource-efficient solutions for metal production and processing. Metals are the basis for innovative products and sustainable economic growth.

Our companies see themselves as partners of their customers and develop demanding technical solutions together with them. Foundry machinery producers have always focused on the responsible handling of natural resources. Over the past few decades it has been possible to make significant improvements in energy utilisation and in the use of other natural resources. A view of the current environmental challenges and the resulting political requirements as well as the growing economic pressures as a result of rising energy and raw material prices, companies will realise further efficiency improvements. This article is intended to inform about what has already been achieved in the field of sustainable metal production and processing. It also indicates the contribution which our industry will make to sustainable development in the future.

Contributed by VDMA, Foundry Machinery Association
Systematically tackling the high-growth ASEAN market

One of the major tasks for the near future is accordingly to open up new high-growth markets. At present, the sector is being confronted with substantial shifts in the export structure, reveals the VDW Chairman’s analysis. China, since 2003 by far the biggest export market for German manufacturers, accounting at times for up to one third of the total, is becoming less significant. Hopes for the re-industrialisation of the USA, with high capital investment in production technology, have so far remained broadly unrealised. Russia, too, for many years the third-largest market, will in the foreseeable future no longer be assuming this role. Europe is accordingly attracting increased attention from German companies, because European customers are confronted with stringent quality requirements on the global markets, and are responding with appropriate investments.

There is definite promise, however, in the ASEAN region and India. They represent a huge potential for the machine tool industry. The task here is to gain customers by offering better products, and to purposefully wrest market shares away from Japan, the leading competitor there. “This means more involvement, more presence, more capital investment, and where appropriate more alliances, in the event that a mid-tier company who are thoroughly familiar with all parts of the production process involved? “A asks Dr. Prokop. At the same time, the ongoing challenges for the companies involved can also be derived from these issues.

Changes in the automotive industry – a challenge for production equipment vendors

The automotive industry, too, the biggest customer grouping for machine tools, is facing a paradigm shift and a transformation of its business model, with substantial effects on production equipment vendors. Driving forces here include regulatory requirements from the politicians and the increasing urbanisation of society as a whole. The paramount issues involved cover the technological transition from the internal combustion engine towards alternative drive forms, plus networked, automated driving. New competitors from outside the sector, like Tesla or Google, are entering the market, and there are new services for customers, like car-sharing models. Digitisation and networking make it possible. “We have to keep an eye on this development,” warns Dr. Prokop.

Generating new customer benefits by networking

For 125 years, German manufacturers have been progressively developing and optimising their technologies. This is why today they are right up there who are leaders globally. In view of the machines’ high degree of technical maturity, however, there is a further challenge involved in expanding the range of services provided with improved customer benefits. “We shall remain successful on the global market only if our products continue to feature state-of-the-art technology and are backed up by enhanced, expanded service capabilities,” is Dr. Prokop’s firm conviction.

Industry 4.0 all at once opens up gigantic opportunities for this. “The task is to generate new customer benefits through networking. As in our private lives, this enables very many activities to be simplified or even automated.” commented Dr. Prokop. Thinking in terms of networking solutions, however, is for many companies still something new, and requires a new perspective.

From a vertical to a horizontal perspective, this is the watchword. The focus must no longer be solely on the machine itself. On the contrary, it has to be optimally embedded in a company’s intralogistics. This gives rise to questions: how, for example, will the workpieces be optimally fed into the machine? How will the machines give the workpieces an identity, or further enrich this identity? How will workpieces be assigned to orders, tracked and rendered locatable at all times? The answers will lead to products and services that create new customer benefits. They could also lead to entirely new machines or, through new assistance systems or to solutions for the material flow and for part tracking. And who could be better placed to implement this than the machine tool manufacturers, who are thoroughly familiar with all parts of the production process involved? “A large field, which in some categories is as yet untilled, and constitutes a massive incentive for the manufacturers’ creativity,” said Dr. Prokop.

Initiative for vocational training

The most valuable resource for the German machine tool industry is to hold its own, to adapt developments, optimally committed staff in all specialisms, on top of their remits and totally motivated. The rapid technical change, in dockwork with Industry 4.0, however, also demand new competences from them.

Against this background, Dr. Prokop regards his excellent initiative for vocational training as an urgent necessity. This also subsumes upgrading the image of vocational training and technical job profiles. Albeit well-known, he feels it imperative to assure adequate financing for the vocational colleges to cover equipment and advanced training, so that young people can be trained in the very latest state of the art.

Dr. Prokop urged the sector itself to take on board the necessity of enthrusting what are called “digital natives” for the machine tool industry, so as to really make optimum use of the potentials offered by networking. “Quite honestly: despite high-tech in the machine tool, high-performance control systems, automation solutions, the use of artificial intelligence, and much more, our sector is regarded as conservative in the world of IT. This has to change,” he urged. One first step, he said, is the “Specialist for Digital Production Processes” project of the VDW’s Youth Foundation.

Heinz-Jürgen Prokop’s summation was this: “The future will be no less exciting. The developments I have described all have major effects on the machine tool industry, in fact will cause definite upheavals. However, the sector has repeatedly coped with changes in the past as well. It’s always been well able to hold its own, to adapt developments, from other fields for its own purposes, and to re-invent itself. This has been demonstrated over the VDW’s 125 years history. We are optimistic for the future as well!”

The German machine tool industry ranks among the five largest players in the world market. It supplies production technology for metalworking applications in all branches of the industrial sector, and makes a crucial contribution towards fostering innovation and progressing productivity in the industry.
Henkel’s focus on sustainability for metals

For metal processing, Henkel’s products start from Cold Rolling Complex, which is a finishing line in steel industries. Our products portfolio for metal processing include pickling process, rolling oil, temper fluid, cleaners, passivation, metal pre-treatment for coil coating lines, and speciality coatings for the coated products.

Henkel’s focus areas for the Asian markets is passivation, metal pre-treatment and special coatings for coated steel as well as electrical steel coatings. Our value offerings for this segment is sustainability,” says Vinay Gandhi, Steering Unit Manager - Steel and Coil, Henkel IMEA in an interview with Paresh Parmar.

What will be your focus area for Asian markets? Like which applications do you see boosting your revenue growth?

Henkel’s focus areas for the Asian markets is passivation, metal pre-treatment and special coatings for coated steel as well as electrical steel coatings. Our value offerings for this segment is sustainability. Generally, customers of steel industry, such as white goods industry, general appliance industry, etc. would require to further treat their products before it is marketed to end consumers. By using our technology, the white goods and general appliance industries can avoid pre-treatment processes, such as phosphating; thereby, reducing the operating cost and improving the product efficiency. Another noteworthy advantage of using our technology is the reduction in effluent treatments, which in turn reduce environmental hazards and improve sustainability.

Could you elaborate on your expertise into rolling oils and specialty lubricants.

Our process chemicals are customized to provide quality and productivity to the flat rolling industry. The experts at Henkel draw on their knowledge and experience to custom design rolling oils for optimum lubrication, cleanliness and reduced costs. The lubricants are available in custom, conventional or synthetic blends. Additionally, Henkel’s chemists and engineers ensure efficient product development and chemical analyses and technical support, while sales representatives, consultants and management provide valuable resources for mill personnel.

We are known for our expertise in rolling oil and specialty lubricants like wet temper fluid for the skin pass mills. In rolling oil we have successfully launched Hybrid Technologies, which is an excellent success in tandem mills as well as reversible mill. In addition to this, our Equipment division provides support to rolling mills. By adding equipment like On Line Sap Equipment, thin film lubrication, flex mix, etc, the robustness of the rolling mill process is increased.

What is the technology shift observed during the recent years in the metal surface treatment and metal processing?

Technology shifts are being witnessed in various areas of metal industries:

- Light weight steel for automotive: Here special grade aluminium is being used in the automotive sector. For which, Henkel offers the following technologies: Non-Chrome metal pre-treatment. Moreover to counter the demand for aluminium, steel industries are working on high strength steel which will reduce weight of automobiles.
- Casting process changeovers: Conversion from sand casting processes to die casting processes.
- Investment Casting: This technology is rapidly gaining ground.
- Leasing or renting of equipment: As companies are looking for flexibility to change their machinery according to the demand.
- Use of robots: With the help of robots, accuracy and precision can be achieved.

INNOVATIVE SOLUTIONS
LOW MAINTENANCE & OPERATING COSTS
EXPORTS TO 15 COUNTRIES

WHERE TECHNOLOGY MEETS CORE

Innovation, Reliability and Commitment are the pillars of Compax Industrial Systems. Compax offers a entire range of Foundry solutions for the famous & non ferrous foundries - From Core-making to Casting Finishing.

With its commitment to introduce upgraded technology and provide competitive business value results to Indian Foundry Industry, Compax proudly brings European Technology to India through their 3 new German Partners.

Compax can now team up with Indian foundries to install world class facilities and boost the productivity by offering an end-to-end solution for the entire foundry setup. In Moulding facilities, No Bake sand applications, Coreshop setups, Casting Finishing Automation and Pollution control systems for Amine cold box core shops.

Compax Industrial Systems Pvt. Ltd.
9 - 112 / 10, M.I.D.C., Bhosari, Pune - 411 026, (INDIA)
Tel. : +91-20-2712 8754 / 35 | Fax : +91-20-6076 7566 | M. : +91-98906 63362 / 82 / 84 / 86
E-mail : info@compaxindia.com / sales@compaxindia.com

www.compaxindia.com
Iron ore reducibility –
ISO 4695 : 2007 and
ISO 4696-1 : 1996
Combined Test Unit.

- Max. temperature: 1100 °C
- Three heated zones over 700 mm
- Determination of the loss in mass during the test
- Triple loop cascade control
- Supplied with retort
- Over temperature protection
- Flame failure gas safety system

www.carbolite-gero.com

The IFO Southern SME Meet and Launch of Indian Foundry Metal Exhibition, 2018 was jointly organized by Indian Foundry Organization and TAFCON at The Lalit Ashok, Bengaluru on June 9, 2016. Dignitaries during the session were
Chief Guest Ravindranath, Chairman & Managing Director, NSIC Ltd; Guest of Honour Gaurav Gupta, IAS, Commissioner, Industrial Development and Director of Industries & Commerce, Government of Karnataka; and Sanjay Chavre, Ministry of Heavy Industries, Government of India.

President Dr S Sundara Murthy delivered the welcome address elaborating on the industrial scenario of the country He spoke about the potential particularly in the auto, railway and defense sectors. Sanjay Chavre, Ministry of Heavy Industries, Government of India presented several schemes to the benefit of SMEs included the latest scheme on capital goods sector. He said funds to the tune of Rs 600 crores has been budgeted.

Gaurav Gupta IAS, Commissioner for Industrial Development and Director of Industries & Commerce, Government of Karnataka, the Guest of Honour spoke about the ease of doing business in Karnataka. He spoke about the infrastructure development, the industrial corridor between Bangalore-Chennai and Bangalore-Dhanbad national highways.

Ravindranath focused on the various schemes available to SMEs regarding availability of raw material, marketing of products. The NSIC portal is proactively viewed by all PSUs and defense purchase departments. Mr V Ramaswamy, Hon Secretary proposed the vote of thanks.

Mr Balu Sathan, Executive Vice President moderated the programme. Over 100 delegates and members participated in the meet.

The senior government officials assured all support to establish the IFO Skill Development Centre which would cater to enhancing the skill of foundry personnel.

President Dr H Sundara Murthy in his welcome address had referred to the Skill Development Centre to be organised at Bengaluru. Dr Sundara Murthy invited the government to partner the proposed high technology Skill Development Centre which would cater to enhancing the skill of foundry personnel.

Several associations viz ALUCAST, FKCCI, KASSIA, KAFA also participated in the deliberations. Indian Foundry Metal Exhibition, 2018 was also launched during the IFO SME Meet.
IFO participated in the Foundry Development Council Meeting

The Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce & Industries, Government of India convened a meeting of the Foundry Development Council at New Delhi On Tuesday, 14th June, 2016. Dr H Sundara Murthy, President IFO was invited to participate.

HEC, corporate member and NIFT, institutional member of IFO were also present at the meeting. Dr Sundara Murthy emphasised the importance of skill development in the foundry industry and informed the Council about the dialogue initiated by IFO with the Industrial Development Commissioner, Government of Karnataka, Department of Heavy Industry, Government of India and NSIC to set up a Skill Development Centre in Bangalore. IFO also raised the issue of inverted duty structure on metal scrap and requested that 2.5% duty should be scrapped.

Ramesh Abhishek, IAS, Secretary, DIPP complimented the efforts of IFO. He assured that DIPP would extend all support to IFO in setting up the Skill Development Centre. Dr Sundara Murthy handed over the concept paper on the proposed centre to Secretary, DIPP.

IIF Batala Chapter felicitates Foundry Review

The Institute of Indian Foundrymen Batala Chapter organised its executive committee meeting on 25th June, 2016 at Batala Club, Punjab. The committee members included: Vinesh Shukla, Chairman; Satish Sarin, Vice Chairman; Naninder Pal Singh, Finance Secretary; and Rajesh Kawatra Secretary.

In the meeting the members discussed the role of technology upgradation for producing quality castings.

During the event the members presented a token of appreciation to Bhupal Potdar, GM, Foundry Review who attended as the guest speaker.

He elaborated on the need of having a good marketing strategy to promote quality products and improving the technical know-how to enhance cost effectiveness.

Elemental Analyzers for CS & ONH

If you are looking for a complete line of products for combustion analysis, look no further than ELTRA.

- **CS & ONH** determination in solids
- From low ppm levels to high percentages
- Thermogravimetric analyzers

**CS Analyzer**
www.eltra.org/cs2000

**ONH Analyzer**
www.eltra.org/onh2000
Complex digital core cuts lead time in half & saves thousands

Morel Industries lowered their scrap rate from 9% to 1% and shaved three weeks off of traditional lead time

Morel Industries needed a solution to eliminate the human error in the assembly of core boxes used with traditional wood and sand patterns.

Working with a local pattern shop with CAD knowledge and expertise, Morel was able to combine 3 cores into 1 printable ExOne core with vents and intricate geometry for their customer, North Harbor Diesel.

Competitive advantage
Additive manufacturing offers shorter lead times, no core shift, reduced casting weight, no tooling for core required, reduced cost and reduced scrap rate.

Conclusion
With ExOne’s digital printing process, 3 cores were combined into 1, decreasing the scrap rate from 9% to 1%. Lead times were reduced by 60% and costs were slashed by 85%.

ExOne’s solutions
ExOne digital part materialization uses three-dimensional printing to create complex molds and cores directly from CAD data for a variety of industries, with accuracies of ± 0.011 in. or ± 0.3mm. The ExOne process achieves geometric complexity and scale unmatched using conventional casting techniques. The process produces accurate, uniform cores and molds rapidly, significantly reducing lead times.

Specifications
Customer: Withheld
Part: Exhaust manifold core
Batch Size: 30
Part Size: 4 x 8 x 28 inch
Material: Gray iron

Traditional Method
Unique wooden pattern for each core.
Hand setting to build core assembly.
Time: 5 weeks
Cost per Batch: $8,000

ExOne Sand Printing Method
Time: 2 weeks after CAD design
Cost: $1,200

In person...
Special Coatings for the high strength Steel.
Coated steel: Architectural application is shifting from hot dip galvanizing to zinc-alume substrate for better corrosion resistance. In this case, the technology has already shifted from traditional chrome passivation to acrylic coating chrome/non-chrome to improve corrosion resistance. The technology has also shifted from traditional passivation to non-chrome paintable passivation/thin organic coatings for appliance and general industries.

Colour coating: The changes here include: non-chrome metal pre-treatment for coil coating industries mainly for appliance & general industries; metal pre-treatment for single coat paint system; and primer pre-treatment for the coil industries.

Electrical steel: We see usage of non-chrome treatment for the electrical steel.

Please share your R&D focus for product development
Our R &D focus is on developing sustainability-centric products, especially non-chrome and heavy metal-free products for the metal pre-treatment process.

In the area of non-chrome, we are working on paintable passivation, metal pre-treatment, and electrical steel coatings. Our non-chrome development platform will cover steel, galvanize, aluminum, electrical steel and special alloy steel. We are working on special coatings which will enable us to reduce process steps in at the end use application and improve productivity. These new coatings will reduce the environmental issues at end user sites.

How do you look at the competition from the local players and other MNCs?
We welcome the competition witnessed at various technology levels, as it keeps us on our feet. However, at Henkel, we believe in value selling, which help us to keep competition at bay and forge a sustainable relationship with our valued customers.

What are your strategies and plans for the Asian market and India in particular?
Our strategy is to focus on products for the entire value chain with an aim to provide one-stop solution to our customers. Due to our strong R&D, technology support and our expertise in the industries, our customers consider Henkel as a solutions provider.
ExOne announces first CHP machine installation

Compared to traditional rapid prototyping procedures, the new technology enables production of high strength molds and cores for sand castings, which until now were achievable only with laser sintering.

CHP accelerates the production process, reduces the risk of rejection and decreases the consumption of resources.

With ACTech having years of experience in additive manufacturing, it was the perfect partner for ExOne to collaborate with in developing the cold 3D phenolic printing process. This process uses less binder while producing resistant cores and molds, which stand up to the complex load of the casting process. Compared to the former procedures, ACTech reduced the use of binder significantly, which is a positive effect that reduces faulty parts caused by gas occlusions. Eliminating the curing time, ACTech can now produce more challenging and fragile moldings in less time and with a decreased reject rate.

Faster production of flexible use moldings

CHP combines advantages in productivity with high-standard characteristics of the new binder solution. Our customers are pleased with the strength, surface finish and high temperature resistance of our cores and mold packages printed with CHP, particularly for light metal castings, such as aluminum, magnesium, iron and steel. We view this as an important offering in our technology and expect a shift in demand for iron and steel casting. Previously, this method was limited with conventional 3D printing systems.

Rainer Hoeschmann, Chief Development Officer of The ExOne Company, commented, “With our focus on accelerating the adoption rate of our technology particularly in the foundry markets, we are excited to offer this new binder solution. Our customers are particularly for light metal castings, such as aluminum, magnesium, iron and steel. We view this as an important offering in our technology and expect a shift in demand toward our machine platforms that allow this type of production.”

ExOne is a global provider of 3D printing machines and printed products, materials and other services to industrial customers. ExOne’s business primarily consists of manufacturing and selling 3D printing machines and printing products to specification for its customers using its in-house 3D printing machines. ExOne offers pre-production collaboration and prints products for customers through its eight production service centers (“PSCs”), which are located in the United States, Germany, Italy and Japan. ExOne builds 3D printing machines at its facilities in the United States and Germany. ExOne also supplies the associated materials, including consumables and replacement parts, and other services, including training and technical support, necessary for purchasers of its machines to print products.

ERP Software specific for the cast metal industry

Cut your business costs, spend less time managing systems and more time focused on profit and growth!

info@synchronamket.com / enquiries@synchronerp.com / synchronamket.com

The ExOne Company, a global provider of three-dimensional (“3D”) printing machines and 3D printed and other products to industrial customers, announces the first machine installation running with the new binder agent, cold hardening phenol (“CHP”). The printer was installed at the ACTech GmbH premises in Freiberg, Germany. ACTech is a leading global rapid prototyping company, which designs and produces casting prototypes and small batches for customers from various industries. Worldwide this is the first 3D printer using the new class of phenolic binder, eliminating the curing process for the cores and molds. As a result, ACTech now is able to provide prototypes of even challenging parts much faster and more cost-effective.

Compared to traditional rapid prototyping procedures, this new technology enables the production of high-strength molds and cores for sand castings, which until now were achievable only with laser sintering.

CHP accelerates the production process, reduces the risk of rejection and decreases the consumption of resources.

With ACTech having years of experience in additive manufacturing, it was the perfect partner for ExOne to collaborate with in developing the cold 3D phenolic printing process. This process uses less binder while producing resistant cores and molds, which stand up to the complex load of the casting process. Compared to the former procedures, ACTech reduced the use of binder significantly, which is a positive effect that reduces faulty parts caused by gas occlusions. Eliminating the curing time, ACTech can now produce more challenging and fragile moldings in less time and with a decreased reject rate.

Faster production of flexible use moldings

CHP combines advantages in productivity with high-standard characteristics of the new binder solution. Our customers are pleased with the strength, surface finish and high temperature resistance of our cores and mold packages printed with CHP, particularly for light metal castings, such as aluminum, magnesium, iron and steel. We view this as an important offering in our technology and expect a shift in demand toward our machine platforms that allow this type of production. The ExOne Company, a global provider of three-dimensional (“3D”) printing machines and 3D printed and other products to industrial customers, announces the first machine installation running with the new binder agent, cold hardening phenol (“CHP”). The printer was installed at the ACTech GmbH premises in Freiberg, Germany. ACTech is a leading global rapid prototyping company, which designs and produces casting prototypes and small batches for customers from various industries. Worldwide this is the first 3D printer using the new class of phenolic binder, eliminating the curing process for the cores and molds. As a result, ACTech now is able to provide prototypes of even challenging parts much faster and more cost-effective.

Compared to traditional rapid prototyping procedures, this new technology enables the production of high-strength molds and cores for sand castings, which until now were achievable only with laser sintering.

CHP accelerates the production process, reduces the risk of rejection and decreases the consumption of resources.

With ACTech having years of experience in additive manufacturing, it was the perfect partner for ExOne to collaborate with in developing the cold 3D phenolic printing process. This process uses less binder while producing resistant cores and molds, which stand up to the complex load of the casting process. Compared to the former procedures, ACTech reduced the use of binder significantly, which is a positive effect that reduces faulty parts caused by gas occlusions. Eliminating the curing time, ACTech can now produce more challenging and fragile moldings in less time and with a decreased reject rate.

Faster production of flexible use moldings

CHP combines advantages in productivity with high-standard characteristics of the new binder solution. Our customers are pleased with the strength, surface finish and high temperature resistance of our cores and mold packages printed with CHP, particularly for light metal castings, such as aluminum, magnesium, iron and steel. We view this as an important offering in our technology and expect a shift in demand toward our machine platforms that allow this type of production. The ExOne Company, a global provider of three-dimensional (“3D”) printing machines and 3D printed and other products to industrial customers, announces the first machine installation running with the new binder agent, cold hardening phenol (“CHP”). The printer was installed at the ACTech GmbH premises in Freiberg, Germany. ACTech is a leading global rapid prototyping company, which designs and produces casting prototypes and small batches for customers from various industries. Worldwide this is the first 3D printer using the new class of phenolic binder, eliminating the curing process for the cores and molds. As a result, ACTech now is able to provide prototypes of even challenging parts much faster and more cost-effective.

Compared to traditional rapid prototyping procedures, this new technology enables the production of high-strength molds and cores for sand castings, which until now were achievable only with laser sintering.

CHP accelerates the production process, reduces the risk of rejection and decreases the consumption of resources.

With ACTech having years of experience in additive manufacturing, it was the perfect partner for ExOne to collaborate with in developing the cold 3D phenolic printing process. This process uses less binder while producing resistant cores and molds, which stand up to the complex load of the casting process. Compared to the former procedures, ACTech reduced the use of binder significantly, which is a positive effect that reduces faulty parts caused by gas occlusions. Eliminating the curing time, ACTech can now produce more challenging and fragile moldings in less time and with a decreased reject rate.

Faster production of flexible use moldings

CHP combines advantages in productivity with high-standard characteristics of the new binder solution. Our customers are pleased with the strength, surface finish and high temperature resistance of our cores and mold packages printed with CHP, particularly for light metal castings, such as aluminum, magnesium, iron and steel. We view this as an important offering in our technology and expect a shift in demand toward our machine platforms that allow this type of production.

Rainer Hoeschmann, Chief Development Officer of The ExOne Company, commented, “With our focus on accelerating the adoption rate of our technology particularly in the foundry markets, we are excited to offer this new binder solution. Our customers are pleased with the strength, surface finish and high temperature resistance of our cores and mold packages printed with CHP, particularly for light metal castings, such as aluminum, magnesium, iron and steel. We view this as an important offering in our technology and expect a shift in demand toward our machine platforms that allow this type of production.”

ExOne is a global provider of 3D printing machines and printed products, materials and other services to industrial customers. ExOne’s business primarily consists of manufacturing and selling 3D printing machines and printing products to specification for its customers using its in-house 3D printing machines. ExOne offers pre-production collaboration and prints products for customers through its eight production service centers (“PSCs”), which are located in the United States, Germany, Italy and Japan. ExOne builds 3D printing machines at its facilities in the United States and Germany. ExOne also supplies the associated materials, including consumables and replacement parts, and other services, including training and technical support, necessary for purchasers of its machines to print products.
The American Metalcasting Consortium (AMC) has finalized its release of the 2016 Metalcasting Industry Roadmap. The project culminates a two-year industry collaboration to identify future research and development needs to accelerate the growth of advanced manufacturing in the U.S. AMC served as the lead organization in the project launched in 2014 by AMC. The goal of the roadmap is to help manufacturers identify, select, and develop technological alternatives and ensure a competitive US metalcasting industry.

“The Metalcasting Industry Roadmap is a great example of collaboration among key groups in the metalcasting industry, said AMC CEO Doug Kukul. “We commend everyone involved in the project, especially Tom Prucha of AMC, who played a leading role in this endeavour. The Roadmap will be a valuable resource as our industry invests in technology, develops talent, and executes R&D planning in the months and years to come.”

The project focused on four main topic areas: process, materials, design, and workforce, with readily executable key tasks mapped to timelines in each area. The roadmap used industry surveys and a focused workshop to develop and document metalcasting capability gaps, solutions, and recommendations for areas of investment that will strengthen the US metalcasting infrastructure in advanced casting production.

The grant that funded the project is a part of NIST’s (National Institute of Standards and Technology) AMTech (Advanced Manufacturing Technology Consortia), which was established in 2013. The AMTech program aims to catalyze partnerships between US industry, academia, and government.

The final Metalcasting Industry Roadmap presents a graphic summary of high level topic areas, research focus areas, and actionable paths to advance the metalcasting industry.

Moving forward, AMC and the metalcasting industry will use the document as a guideline to help shape the direction of research and development work and as a tool to help secure additional government funding.

The American Foundry Society is a not-for-profit organization formed in 1896. With its headquarters in Schaumburg, Ill., AMC provides members and consumers with information and services to promote and strengthen the metalcasting industry.

Hüttenes-Albertus announces purchase of Hexion’s interest in HA-Int’l

Hexion Inc (Hexion) and Hüttenes-Albertus Chemische Werke GmbH (HA) announced that Hexion has sold its 50% interest in HA-International, LLC (“HA-USA”), a joint venture serving the North American foundry industry, to its joint venture partner HA-USA Inc, an entity controlled by HA. HAI is the market leading manufacturer and supplier of foundry resin systems, resin coated sand for shell molding and refractory coatings for North America. HAI will continue a strategic sourcing arrangement with Hexion’s Louisville, Kentucky site. Terms of the transaction were not disclosed.

“This transaction represents an important step for HA and further strengthens our foundry leadership position in the US,” said Dr Carsten Kuhlgaert, President and CEO, Hüttenes-Albertus Chemische Werke GmbH.

“The acquisition of Hexion’s interest in the joint venture demonstrates our long-term commitment as a solutions provider that is well positioned to deliver sustainable customer value within the foundry industry, while broadening our product portfolio and providing innovative technologies to our customers globally.”

“We have operated HAI in close partnership with HA for many years and have jointly developed that business into an industry leader in the U.S.,” said Craig O. Morrison, Chairman, President and CEO, Hexion.

Although we have sold our ownership stake in HAI to our joint venture partner, our relationship with HAI will continue in all material respects as we focus on serving HAI customers without interruption. We look forward to serving HAI as a large and valued customer.”

Hexion and HA have entered into long-term toll agreements for the supply of resins and special coated sands whereas HAI will provide special coated sands and Hexion will provide resins.
Focus on middle- & high-end castings

“Low price” is not synonymous with Chinese castings anymore, since now more and more high-end castings have taken the large share of the market, which can be directly seen from Metal China 2016, the products are not only elegant and most are high-tech.

Among the exhibitors, KOCEL Group displayed 10 products including the new machine tool bed that the exterior and sand core are produced with 3D printing technology with mass production. Liaoning Fu-An Heavy Industry Co Ltd showcased the bogies for passenger and freight dual-use locomotive during the show.

FAW Jiangsu Foundry Company’s six-cylinder head casted by vermicular graphite cast iron has controlled its vermicular graphite rate at above 90%, and the casting wall thickness is 3±0.5mm. Foundry experts were excited to see excellent castings at the exhibition. These include the turbine castings from Impro Aerospace Components (Wuxi) Co Ltd, the housing of 800KV disconnector by Fuxin Wanda Components (Wuxi) Co Ltd and the 4HK1 cylinder head casted by vermicular graphite cast iron has controlled its vermicular graphite rate at above 90%, and the casting wall thickness is 3±0.5mm. Foundry experts were excited to see excellent castings at the exhibition. These include the turbine castings from Impro Aerospace Components (Wuxi) Co Ltd, the housing of 800KV disconnector by Fuxin Wanda Components (Wuxi) Co Ltd and the 4HK1 cylinder head of Chongqing Qingling Foundry Company.

Intelligent foundry machinery

A variety of digital and intelligent equipment attracted a large number of visitors. For example, Suzhou Hawk Foundry Equipment Company displayed its sliding-rail casting with robot servo and six axis servo core-transfer and core-remover system. WHI Industry Technologies (Shanghai) Co Ltd presented the industrial robot automatic polishing equipment.

Also Zhejiang Wanfeng Technology Development Co Ltd showed its gravity casting unmanned production line.

“Internet+” highlighted the show

With 5000 years history, foundry industry is keeping pace with the times. Remote design, remote control, virtual production, 3D printing and all kinds of robots have extensive application now, and even digital foundry plant has become a reality.

Foundry E-Commerce (a B2B e-commerce platform) has been online successfully, creating an online and offline development mode integrated with “internet+ foundry”.

By this internet platform and multi-media technologies, the equipment suppliers will be able to improve efficiency and receive orders worldwide. It’s a useful method to implement the supply side innovation and realize transformation and upgrading. Foundry E-Commerce attracted wide attention during the show, which will bring profound changes to the foundry industry.

Concurrent activities

There were almost 100 concurrent activities during the show, such as technical seminars, sourcing fair, and ‘robot demonstration area’ and ‘3D printing operating and experience area’ were two additions, with 425 sq m and 210 sq m respectively. Visitors had interaction opportunities impressed during these activities integrated with demonstration, teaching and entertainment. Besides, the special exhibition for the 30th Anniversary of China Foundry Association, “Belt and Road” Foundry Industry Alliance Signing ceremony were also held.

The 4-day exhibition achieved a big success in 2016 and the next Metal China will be held in Shanghai together with Die Casting Exhibition in 2017.
Electrotherm offers
Digital Inverter Technology

- Fibre optic communication between controller and thyristor modules
- Global accessibility through secured Ethernet connectivity
- Data logging for 10 years

The Engineering & Projects (E&P) division of Electrotherm (India), the leader in providing total solutions for mini steel plants, has designed and developed state of the art Digital Technology for Solid State Frequency Converters in the range of 10000 KW to 32000 KW.

The latest in-house development of technology, DIFOC, offers numerous special attributes, viz.

- Microprocessor based Digital Control for Solid State Frequency Converter
- Performs all controlling, regulating and protecting functions of converter and inverter
- Fibre optic communication between controller and thyristor modules
- Real-time digital display of all operating parameters
- Energy monitoring and data logging system
- Built-in melt cycle evaluator when coupled with load cells automatically controls the energy required for melting and superheating
- Ethernet port facility for connectivity to SCADA system / remote computer
- Globally accessible equipment through secured Ethernet connectivity
- Internal self-test, remote diagnosis and tele-support
- User friendly system through language selection in GUI