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### The Regional Economic Integration Welcomes You in ASEAN

ASEAN represents the region of the future of about 600 million citizens, where large multinational companies are already operating, attracting suppliers and buyers alike by steady growth and the favorable investment policy environment.

Two years ago, when the first Indometal took place in Jakarta in Indonesia, for sure it was predictable that this event would become a benchmark for the metallurgical industry in Indonesia and the ASEAN countries.

In December 2014, the second exhibition “Indometal – International Metal & Steel Trade Fair for Southeast Asia” (organized by Wakeni and Messe Düsseldorf Asia) has arrived once again. On behalf of the leading manufacturers of foundry equipment, suppliers, thermo process technology, consulting and

European Associations, Foundry – Planet Ltd. provides the first “Foundry-ASEAN” magazine to summarize a current view on technology suppliers and economic relationships.



Thomas Fritsch

The [www.Foundry-Asean.com](http://www.Foundry-Asean.com) will be circulated to our entire South Asian database as an E-magazine shortly before the fair and will be passed out to the visitors as a print magazine on the Indometal fair grounds.

Whether you prefer the digital version with additional links to further detailed reports, or if you prefer the print magazine, enjoy anyway!

The Foundry-Planet Team looks forward to your response on the publication and wishes all participants a successful event.

Good Luck and Best Regards

Thomas Fritsch  
Foundry-Planet Ltd  
CEO of Foundry-Planet Ltd

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## ASEAN, UNCTAD Launch ASEAN Investment Report 2013-2014



**Nay Pyi Taw, 10 November 2014.** On the occasion of the 4th ASEAN Investment Forum (AIF), ASEAN and UNCTAD jointly launched the ASEAN Investment Report 2013-2014. This Report was prepared under a technical cooperation arrangement between the ASEAN Secretariat and the UNCTAD Division on Investment and Enterprise (DIAE) with financial support from the Australian Government through the ASEAN-Australia Development Cooperation Program Phase II (AADCP II).

This latest ASEAN Investment Report is entitled “FDI Development and Regional Value Chains”. It highlights the continuing rise of foreign direct investment (FDI) flows into ASEAN, which performed well among the developing regions. The Report shows that ASEAN had attracted FDI inflows exceeding \$122 billion in 2013 – about on par with those to China – up from \$114 billion in 2012. Growing corporate income and cash reserves of ASEAN companies further supported strong intraregional investment. The Report also provides analysis on the increasing regional value chains (RVCs) contributed by rising FDI. RVCs in ASEAN now involve more companies, more ASEAN countries, and a wider range of products and industries in the region. The Report further illustrates how RVCs strengthen regional connectivity through production, investment, trade and business linkages, complementing the three pillars of ASEAN Connectivity of physical, people and institutional connections.

ASEAN’s integration efforts are pursued through key regional measures that among others, strengthen investment cooperation among ASEAN Member States, enhance investment protection and liberalization regimes, and promote ASEAN as an integrated investment and production network. All these have contributed to make the ASEAN region an attractive destination for foreign direct

investments (FDI). Anchored by strong macroeconomic fundamentals, improved policy environment and greater regional market prospects as well as rising investor confidence thanks to the vast opportunities and the relative peace and stability of the region, ASEAN remains a significant recipient of global FDI flows. In 2013, ASEAN attracted US\$ 122 billion, accounting for 8% of the global FDI. This includes increasing investments from ASEAN Member States, which at 17% of the total FDI inflows, is now the third largest source of FDI in the region.

With ASEAN’s continuing success as a competitive location hosting intermediate manufacturing facilities as well as value chain operations of transnational corporations (TNC), this year’s ASEAN Investment Report focuses on FDI development and regional value chains. The Report illustrates how the expansion of TNC operations and the increase in capacities of local firms to produce inputs have helped strengthen the development of the regional value chain which, in turn, underpins and contributes to ASEAN’s robust and resilient economies. This Report will not only be a useful reference for ASEAN’s business community on their existing operations and expansion plans, it also shows ASEAN’s commitment to facilitate and promote investments in the region as we are moving forward to the realization of the ASEAN Community by 2015.

**Read the full Report on [www.Foundry-Asean.com](http://www.Foundry-Asean.com)**



Ernst & Young:

## Complexities and trade barriers challenge regional economic integration in ASEAN

**Singapore, April 2014 – Political, legal and organizational complexities and regulatory burden, as well as the lack of uniform and harmonized trading rules among the ASEAN nations, are hampering the progress of the 2007 ASEAN Economic Community (AEC) Blueprint, which seeks to achieve regional economic integration by 2015.**

- Policy uncertainty hampers setting up of business
- Need for uniform and harmonized trading rules
- Investment promotion bodies crucial to driving FDI into ASEAN

A new EY report, *Trade Secrets: ASEAN economic community and inward investment*, explores the progress of the AEC through the eyes of business, and in particular, at the impediments to doing business in ASEAN. According to the “ASEAN Economic Community Scorecard 2012”, only two-thirds (67.5%) of the targets for an integrated economic region by 2015 have been met.

Mildred Tan, EY’s Asean Government & Public Sector Leader says: “This is perhaps unsurprising, given the economic diversity and varying growth maturity in each of the member countries. At the same time, we often see that national and local priorities supersede regional initiatives, obscuring wider goals. While macro problems persist, on the micro level, there are many areas where solutions can be applied.”

On the other hand, the business community has also been lukewarm towards the overall progress of the AEC. The reasons are three-fold: first, businesses require greater clarity on inter-government collaboration; second, the business community prefers to deal directly with each other; third, a need for stronger focus from governments on prioritizing and solving the problems, particularly those directly relating to investment and business operations.

“Businesses can be both the beneficiary and the facilitator of the AEC. Often, public-private consultation holds the key to unlock the value of any transformation. By examining the impediments to doing business in ASEAN from the business’ perspective, we hope to offer pragmatic policy and implementation recommendations to governments,” adds Tan.

The report puts forth that total foreign direct investment (FDI) attracted (among other indicators) could be regarded as an indicator of the progress and success of the AEC development, and focuses on the underlying FDI issues to reveal solutions to contribute to the 2015 goal.

### Policy uncertainty hampers setting up of business

One of the biggest challenges that investors face in setting up businesses in ASEAN is the need for clarity and certainty in local laws, government policies and legal environment. Examples of such uncertainty are amendments to important legislations with little notice, arbitrary interpretation of laws or policies, and outdated rules and regulations.

Other issues that plague businesses and investors in ASEAN include complicated procedures and long delays in starting up businesses, multilayered approvals for licenses, legalization of documents, regulatory requirements, foreign ownership restrictions, politics and bilateral relations.

Sophia Lim, Director of Corporate Secretarial Services – Global Compliance & Reporting at EY shares that the most logical and effective solution is to amend policies for ease of starting business. “Simplification and clarity are key. A three-pronged approach at the regional, national and local government is needed. ASEAN countries could look into the standardization of regulatory processes and information requirement, and having a one-stop registry exchange and an ASEAN business portal. There also needs to be continual dialogue between business and policy-makers, and among jurisdictions within the same country and across countries.”

### Need for uniform and harmonized trading rules

Two of the important issues affecting intra-regional trade in ASEAN are the various entry barriers and the need for certainty in obtaining and retaining preferential tariff concessions under the ASEAN Trade in Goods Agreement (ATIGA).

Tariffs on imported goods are generally a barrier for businesses. In line with the ATIGA schedule, six ASEAN member states – Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand – have eliminated tariffs on almost all goods that are produced in the region, while newer members such as Cambodia, Laos, Myanmar and Vietnam are committed to eliminate tariffs on such goods by 2015, with some flexibility to extend the deadline to 2018.

However, the free flow of goods in ASEAN has yet to become a reality, given existing non-tariff barriers to cross-border trade. For example, while ASEAN has established a common eight-digit tariff classification system, in practice, it is still common for importing customs authorities to adopt differing product classifications and deny benefit of ATIGA preferential duties. This is on top of other gaps, including the disparity in the time taken for goods to clear customs checkpoints, which can range between 4 days and 26 days across ASEAN countries, resulting in unnecessary costs and inefficient and unpredictable supply chains.

Shubhendu Misra, Partner, Indirect Tax – Global Trade at EY in Singapore comments: “Having uniform and harmonized trading rules, as well as eliminating varying and often opaque administrative practices and protectionism, is important. This, combined with the inherent lack of trust in the trading community by pockets of customs administration, is curtailing the full benefits of free trade.”

Misra adds that the recent WTO Agreement on Trade Facilitation will provide an excellent reference for ASEAN to embrace and implement as part of the run-up to the AEC. “Many of the trade facilitation measures forming part of the WTO Agreement are in areas where ASEAN currently lacks. Early adoption by ASEAN on a unilateral basis would send a strong signal to the world that ASEAN is open for business,” he says.

### Investment promotion bodies crucial to driving FDI into ASEAN

One of the intended objectives of the AEC Blueprint is to enhance the growth of inbound FDI into ASEAN. Certain ASEAN countries such as Malaysia, Singapore and Thailand are relatively more successful in attracting inbound FDI. One of the key success factors is the presence of strong investment promotion bodies, which facilitate investors’ entry when investing into a country. For an investment agency to be effective in its role, it must have significant

ability to approve or influence the workings of the government, ensuring a smooth experience that boosts the confidence of the investor.

Tan Bin Eng, Asean Leader for Business Incentives Advisory at EY observes that while all the ASEAN countries have investment agencies that administer a number of FDI incentives, several differences are clear. “Not all have the authority to approve incentives even if these are legislated with clearly specified criteria; some also frequently lack the power to influence regulatory and licensing approvals; and some do not have overseas offices to facilitate investment promotion. To that end, more can be done to share best practices across ASEAN’s investment bodies.”

While ASEAN also traditionally competes internally for FDI, there is more to gain from being allies than competitors. Tan (Bin Eng) adds: “ASEAN investment bodies can cooperate to identify areas ripe for collaboration across the region. These can include specific industries and sectors, or specific geographic locations. Bilaterally or multilaterally, these areas can then be developed further into value propositions with which ASEAN investment agencies can approach foreign investors as a semi-collective body, providing investors with a more complete view of ASEAN and what it has to offer.”



Read the full report on  
[www.Foundry-Asean.com](http://www.Foundry-Asean.com)

#### EY ASEAN Business Services Network

The EY ASEAN Business Services Network is a highly globally integrated team of professionals located in key geographies, focusing on building and bridging business opportunities between ASEAN and the rest of the world. Our teams are culturally aligned and equipped with

local market knowledge and language skills to proactively serve the needs of the ASEAN markets. Through providing skills and insights that are aligned with the investment profiles and risk appetites of our clients, we help them identify and select investment opportunities with pace and precision, avoid pitfalls, mitigate risks while meeting their business growth objectives.

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Around the world, governments and not-for-profit organizations are continually seeking innovative answers to complex challenges. They are striving to provide better services at lower costs and to ensure sustainable economic development, a safe environment, more transparency and increased accountability. EY combines private sector leading practices with an understanding of the public sector's diverse needs, focusing on building organizations to deliver improved public services. Drawing on many years of experience, we can work with you to help strengthen your organization, deliver value for money and achieve lasting improvement. Our Global Government & Public Sector Center brings together teams of highly skilled professionals from our assurance, tax, transaction and advisory services. We are inspired by a deep commitment to help you meet your goals and enhance public value, today and tomorrow.



For more information, please contact:

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Website: [www.ey.com](http://www.ey.com)

Frost & Sullivan – Strategic Analysis of ASEAN Automotive Outlook:

## ASEAN to emerge as a key global automotive market and production hub by 2019

**The ASEAN region offers a significant opportunity to global automakers in the near to medium term, says Frost & Sullivan. Mr. Vijay Rao, Research Director, Asia Pacific at Frost & Sullivan said that the importance of ASEAN as a cluster cannot be denied as the region is likely to be the fifth largest automotive market in the world by 2019.**

New analysis from Frost & Sullivan (<http://www.automotive.frost.com>) Strategic Analysis of ASEAN Automotive Outlook finds that the market is likely to grow at a compound annual growth rate (CAGR) of 5.8 per cent (2012-2019) to reach 4.71 million vehicles in 2019, mainly driven by rapid market expansions in Indonesia and Thailand.

Mr. Rao added that the low level of motorization in ASEAN offers strong growth potential for the automotive market, while the heavily-motorized regions of Western Europe and North America represent a saturated „replacement“ market. He added that passenger vehicle segments are likely to dominate the market. „Thailand the key pickup market in the region is shifting to passenger

vehicles with increased consumer preference for compact, environment friendly eco cars,“ he said.

Mr. Rao predicts Indonesia to emerge as the largest automotive market in ASEAN by 2019, accounting for 2.3 million vehicles, driven by sustained economic growth in the country, growing middle classes with larger disposable incomes, increased investments in automotive sector and introduction of automotive regulations supporting market growth.

He added that automotive demand in Thailand is also expected to grow driven by an improved economy, more disposable incomes, capacity expansions by automakers, and launch of several new vehicle models. „The Malaysian market is expected to grow supported by foreign model proliferation at competitive price points and by price reduction as a result of market liberalization,“ he said. He added that total vehicle production in ASEAN is expected to grow at a CAGR (2012-2019) of 8 per cent to hit 7.05 million units in 2019. „Thailand is likely to continue its dominance as a major production hub in ASEAN due to expected significant capacity



# B

## BRAUN Innovations for Steel Technology at the cutting edge



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expansions, increased export and domestic demand, availability of skilled labor force with a well-developed automotive component industry," he said.

Mr. Rao said that vehicle production in Indonesia mostly caters to local sales driven mainly by the expected expansion in automotive demand and foreign investment inflow for production expansion. He noted that European and Chinese OEMs are looking at Malaysia as an assembly and manufacturing hub to set up production plants.

If you are interested in more information on this study, please send an e-mail to Alice Chia, Corporate Communications - Asia Pacific, at [alice.chia@frost.com](mailto:alice.chia@frost.com), with your full name, company name, title, telephone number, company e-mail address, company website, city, state and country.

**Strategic Analysis of ASEAN Automotive Outlook** is part of the Automotive & Transportation Growth Partnership Services program, which also includes research in the following markets: 2020 Vision of the Australian Automotive Aftermarket, CEO 360 Degree Perspective of the Automotive Industry in Myanmar, Strategic Growth Opportunities from AEC Implementation and New Government Policies in ASEAN, Strategic Growth Opportunities of Navigation Systems Market in ASEAN, Analysis of the Advanced Driver Assistance Systems Market in Japan amongst others. All research services included in subscriptions provide detailed market opportunities and industry trends that have been evaluated following extensive interviews with market participants.



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EKONID AHK Indonesia / BMWi Business:

## Matchmaking Trip Indonesia 2014

**Construction-, Processing- and Special-Machinery – State of the Art Technology Made in Germany – 2. - 5. November 2014**

Supported by the German Federal Ministry of Economics and Energy (BWi) and the German Engineering Federation (VDMA), EKONID has hosted a 3-day high profile trade mission in Indonesia from 2nd to 5th November 2014. The trade mission was especially designed in order to support small and medium-sized companies in their business activities abroad.

The event was split up into two different parts beginning with a 1-day conference in Jakarta. In the course of the conference high profile speakers from participating German companies active in the heavy equipment sector has introduced their business activities and the latest technologies from Germany. Beforehand experts from the public sector and related associations have provided a general overview of the current state of Indonesia's construction

and construction machinery sector. On the following two days EKONID arranged matchmaking meetings between the participating German companies and decision makers of Indonesian companies. Participants of the matchmaking were able to discuss future mutual beneficial business cooperation directly with company representatives and to share views and expertise on the sector.

10 companies from Germany with state of the art technology Made in Germany have joint this business matchmaking delegation to Jakarta. More information about participating companies and their presentations please visit the website of AHK Indonesia.

**Please find all the presentations on [www.Foundry-Asean.com](http://www.Foundry-Asean.com)**



**For more information, please contact:**

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The HiTEQ™ “MiniMelter”, 200 kg/h to 500 kg/h melt rate; Compact dual-chamber design - melting and holding directly at the casting station - eliminating molten metal transfer costs and temperature fluctuations.

## **ANDRITZ HiTEQ Furnace Line**

Along with its acquisition of Bricmont, ANDRITZ received the intellectual property rights for the HiTEQ furnace line in 2012. Bricmont is well known in China and around the world for its large Aluminum melting and holding furnaces (up to 140t capacity). In the past 18 months HiTEQ has reestablished its legacy of over 25 years as a premium supplier for the die casting and foundry industry. We are proud to offer a unique technology package with focus on efficiency and cost effective solutions.

HiTEQ has traditionally supplied world leading Aluminum die casting and foundry plants in USA, Australia and Asia with Mini Melters, Wet Bath and Dry Hearth Reverbs, Chip Melters, Stack Melters and our top of the line All-in-One furnace – the single solution for all automotive plants that are looking for a stack furnace with a large dry hearth and integrated chip melting capabilities.

“Our technology, combined with the extensive experience of ANDRITZ Bricmont enables us to provide our customers with furnaces starting from a capacity of 200 lbs up to over 140 metric tons,” says Scott Kennedy, VP HiTEQ. This is unique in the market. Our engineers learn not only in one segment of the aluminum market but learn from smaller and bigger plants as well and utilize this knowledge to design better more efficient furnaces in all sizes.

“Our unique connection with the Aluminum Industry not only serving the melting needs in the foundry or die casting plant but also providing downstream equipment helps us to understand our customers and their needs further than any of our competitors” claims Martin Neuhold, who is in charge of the HiTEQ Product Group in the SouthEastAsian markets. The HiTEQ product line is engineered in close connection to the customers’ locations and needs. We have engineers in Shanghai China, Duesseldorf Germany and Canonsburg PA USA.



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 Website: [www.andritz.com/metals.htm](http://www.andritz.com/metals.htm)

ASK Chemicals:

# Innovative solutions for environmentally-friendly and highly productive processes

The foundry industry has found itself under competitive pressure for many years now. Environmental regulations and the interests of local residents often mean that foundries have to implement measures aimed at reducing emissions. Fulfilling these requirements often entails high levels of investment, unfortunately often with little financial payback. Of course, expectations are also increasing in terms of the demands placed on the casted parts. Foundries have to be able to turn the complex ideas of the design engineers into reality. Ultimately, casting buyers ruthlessly choose on price alone when placing contracts, regardless of whether they are buying for the automotive industry or for medium-sized mechanical engineering companies. Good quality and on-time delivery are expected as a matter of course.

The continuous evolution not only of castings with regard to their complexity and increased dimensional accuracy but also of the various relevant environmental aspects all have an impact on the choice of core and molding material, the coating and – in particular – the binder too. This article provides foundrymen with an overview of recent developments in the various binder systems.

## Latest-generation reduced-emissions cold box HE (high-efficiency) binder systems

The environmental disadvantages of conventional binders result from their composition, with the main constituents being a phenol formaldehyde resin in solution in part 1 and diphenylmethane diisocyanate (MDI) in solvents in part 2. The pyrolysis triggered by the hot melt during casting causes the release of BTX (benzene, toluol and xylene) and further aromatic compounds from which benzene derivatives arise. The air that is mixed with this must be immediately extracted and purified – a complex and expensive process. For this reason, ASK Chemicals initiated a series of detailed investigations into the development of new cold box binder systems.

The starting point for the development concept was to improve the efficiency and yield of the system through increased reactivity and therefore reduced use of binders for the core production. This has been achieved with the aid of a newly developed procedure involving resin synthesis with specially coordinated solvent combinations. The resulting reactivity of the binders provides the cores with enough strength to ensure that the subsequent process steps can take place without any problems.

The core strength achieved in this way makes core production more reliable, while at the same time reducing rejection rates (Figure 1).

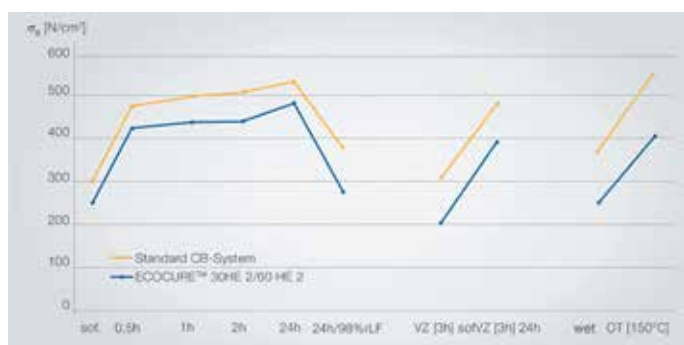


Figure 1: A comparison of strength curves

Using less material also means less condensate, which can otherwise be deposited in the molds and then needs to be removed with a lot of care and effort. Cleaning times are significantly reduced as a result. Consequently, productivity is dramatically increased thanks to increased mold availability. In summary, this development will deliver savings and important economic benefits for foundries.

HE (high-efficiency) cold box binder systems are therefore much more efficient than standard binder systems. Although they cost more, the potential savings and additional benefits associated with their use easily recoup this outlay. The additional boost to the availability of the molds, the reduced reject rates and the reduced operating costs for core shooting can amount to several tens of thousands of euros per year.

The advantages for foundries are clear: Emissions are significantly reduced, costs associated with materials, storage and disposal are cut dramatically, and production becomes more efficient overall.

## Innovative polyurethane no-bake systems or furan resin systems with reduced emissions

Of course, the primary concerns when it comes to make the best choice of polyurethane no-bake system or furan resin system are performance and cost-effectiveness. But any analysis of the cost-effectiveness of mold production technology must look beyond just the price per unit weight and also consider yield, processing parameters (processing and mold release times) and the quality of the products produced using this binder. Technology is increasingly being assessed in terms of environmental aspects such as emissions during mold production and during casting. The regeneration capacity of the released sand should also be taken into account in cost analyses.

The sand-related technical properties of a polyurethane no-bake system and the resulting strength values are excellent, as is the ratio of sand mixture processing time to mold release time, and this enables a dramatic increase in productivity. One of the strengths of the polyurethane no-bake technology is the excellent surface quality of the cast part, but this is countered by the relatively high emissions (Diagram 3), the strong odor and the smoke produced during casting. These factors are likely to hinder widespread acceptance of this technology in European foundries. But with the development of the Pep Set Quantum Binder, we have overcome

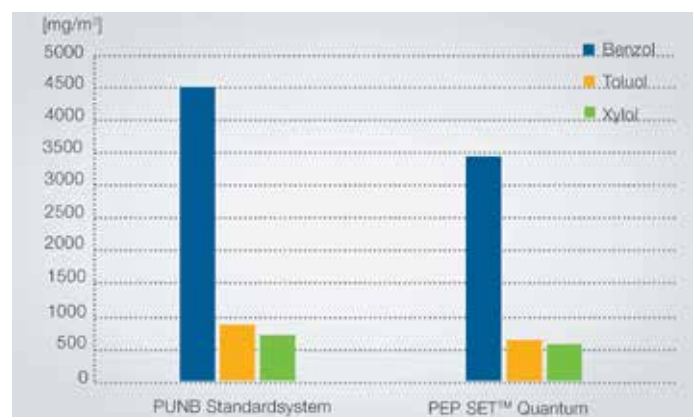
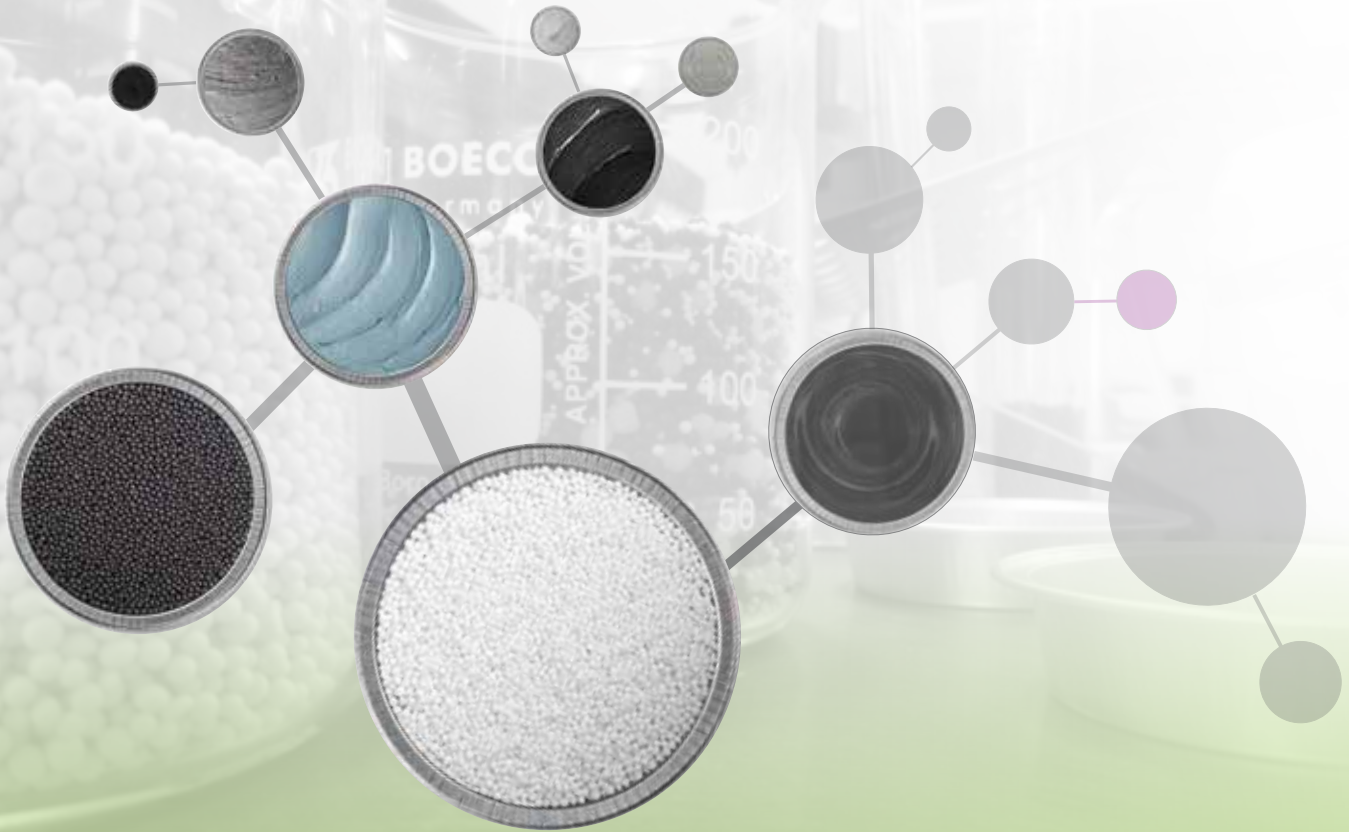


Diagram 3: Noxious emissions (BTX) from a PUNB standard stem compared with PEP SET Quantum

## YOUR CHEMICAL EXPERT

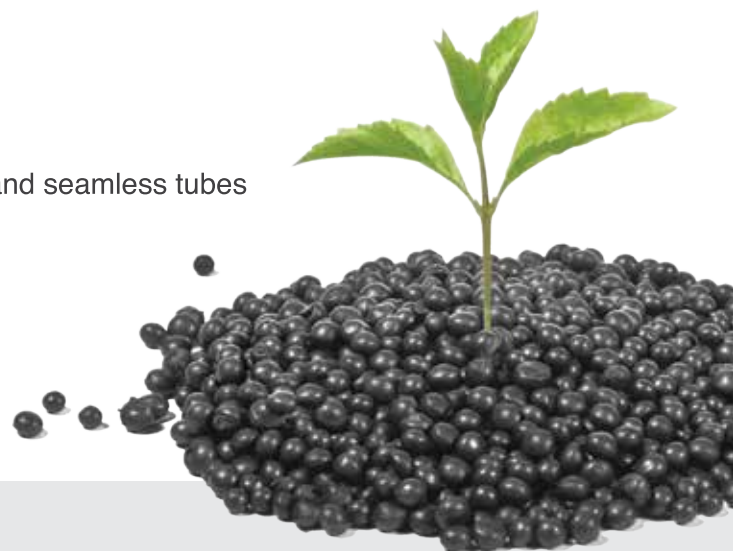


Fochem International is your chemical expert. We offer innovative, efficient and practical tribological solutions for the metal working industry worldwide.

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- / High pressure Die-Casting Lubricants and Release Agents
- / Plunger beads
- / Coatings for gravity and low pressure Die-Casting
- / Forging and Extrusion compounds
- / Dry lubricants for aluminium, brass and copper Extrusion
- / Coatings for aluminium refineries, electronics industries and seamless tubes
- / Distributor of the high-tech German Beads-Dispenser 3D
- / Graphite Powders

Tailor-made solutions can be offered if needed.  
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this hurdle too. Thanks to this new technology, the smoke intensity can be reduced by between 40% and 50% compared with a standard polyurethane system. The performance-to-cost ratio of a Pep Set Quantum System is among the best in the field of self-hardening processes.

A latest-generation binder has also been developed in the field of tried-and-tested furan resins. The development of new resin qualities with a level of furfuryl alcohol below 25% as a monomer was initiated by the classification of furfuryl alcohol as „toxic“. The reduction in the proportion of monomer furfuryl alcohol in a furan resin is made possible thanks to a special technique for the condensation reaction. In the process, the sand and casting-related technical properties remain virtually unchanged. By contrast, measurements in a number of foundries have shown that the FA emissions can be reduced by up to 80% (Diagram 4).

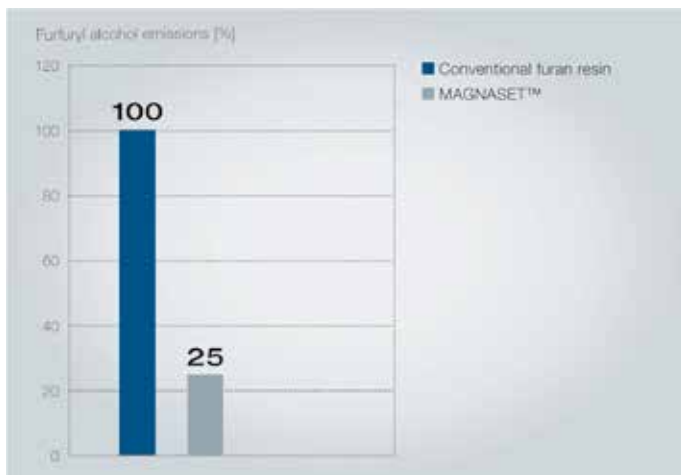


Diagram 4: Reduction of FA emissions by up to 75% thanks to the use of MAGNASET

**Hybrid Coatings Technology**

ASK Chemicals has developed an innovative hybrid system based on water, which can be used as a combustible alcohol-based coating or as a water-based coating. SOLITEC™ HY is a new revolutionary approach to diluting a water-based coating with isopropanol. This water-based coating can be brushed, sprayed or used for overpouring. If diluted with isopropanol, it can be used for spraying, overpouring or dipping. A key advantage over traditionally used coatings containing zirconium is this coating's lower density and hence better mileage and cost effectiveness. Moreover, being a pure water-based coating, SOLITEC™ HY is a non-hazardous substance. This reduces the investment costs for its storage. To

reduce the environmental impact, the coating can be diluted with water where drying time is sufficiently long enough and only diluted with alcohol where time issues matter in production. This zircon-free refractory combination is used for heavy and thick-walled iron castings. In such extreme applications, it provides the same or even better casting results than achieved with series coatings containing zirconium. As zircon coatings have an intrinsic radioactivity, ASK Chemicals is helping to improve the workspace conditions with this non-zircon-based coating. ASK Chemicals has developed the hybrid system further and now can offer MIRATEC HY 505 as a hybrid coating for dip application for automotive foundries.

Practical example:	Zirconium coating	Zirconium-free SOLITEC™ HY	Savings
• Castpiece: ductile iron	1.2	1.2	
• Real thickness approx. 20-30µm	1.2	1.2	
• Furan resin mass	1.2	1.2	
Density	1.90	1.20	
Costs/l for same base price	100	67	-33
Annual coating consumption	100	69	-31
Annual costs for finish-processed coating	100	64	-36

Costs are based on exemplary prices, which are not to be considered as a quote.

**Before**

**After**

- Use of alcohol-based zirconium coating
- Application at 15° BE (ρ = 1.9 g/cm³) approx. 20µ (DN 4mm)

- SOLITEC™ HY diluted with 50% IPA
- Application at 40° BE (ρ = 1.2 g/cm³) 17µ (DN 4mm)
- The Coating has perfect surfaces, more than with zirconium coating

Costs are based on exemplary prices, which are not to be considered as a quote.

**Summary**

The need to reduce emissions while keeping production on a commercially viable footing demands innovative solutions. This is also especially relevant in the field of core production, because the use of suitable binders and coatings can deliver high efficiency values. In the process, the ability of the producer to compete remains the most important goal, since „going green“ is not enough in itself to sell a product. Ultimately, aside from the costs, it is vital to keep sight of the benefits – that is, the quality and functionality – of a product. Weaknesses in these areas cannot be compensated with environmentally sustainable production.

**ASKCHEMICALS**  
We advance your casting



**For more information, please contact:**

ASK Chemicals GmbH, Hilden/Germany  
Written by Antoni Gieniec, Pierre-Henri Vacelet and Reinhard Stötzel

Website: [www.ask-chemicals.com/DE/foundry-products](http://www.ask-chemicals.com/DE/foundry-products)

BRAUN Maschinenfabrik:

**Technology leader for steel cutting and grinding facilities present at “INDOMETAL 2014”**

**BRAUN Maschinenfabrik GmbH is the leading producer of state-of-the-art cutting and grinding machines with associated material handling and automation systems for steels and non-ferrous metals. BRAUN was established in 1848. In regards to quality and technology, BRAUN has always been the market leader. Customer orientation, guaranteed delivery, extensive service and on-going research and development have made BRAUN the preferred supplier for the world's metal industry.**

BRAUN's product range comprises high-performance abrasive cut-off machines (up to 2000 mm cutting wheel diameter) for cold,

warm and hot cutting, high-pressure grinding machines for various steel products, tailor-made material handling and automation systems. BRAUN technology is used in rolling mills, forging lines, special steel melt shops and foundries, pipe mills, peeling lines, conditioning and inspection lines, finishing lines and R & D laboratories. BRAUN's range of services includes consulting engineering for project studies and planning engineering, as well as site services and extensive after sales support. Already recognized as being the leading technologies for cutting and grinding of semi-finished steel and special alloy products in most parts of the world (including Europe, North America and Far East), BRAUN has now also started



# Metal + Metallurgy China 2015



第十三届中国国际铸造博览会  
The 13th China International  
Foundry Expo (Metal China)

第十五届中国国际冶金工业展览会  
The 15th China International  
Metallurgical Industry Expo

第十三届中国国际工业炉展览会  
The 13th China International  
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China Foundry Association



中国钢铁工业协会  
China Iron and Steel Association



中国机械工程学会  
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中国国际贸易促进委员会冶金行业分会  
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Hannover Milano Fairs Shanghai Ltd.

2015年3月31日-4月3日  
31 March-3 April, 2015

中国博览会会展综合体(上海虹桥)  
China Expo Complex (Shanghai Hongqiao)



Abrasive cut bar ends

to introduce their state-of-the-art steel cutting and grinding machines to South-East Asia. A first contract for TATA Steel Thailand / NTS Steel Group Public Co., Ltd., on a high-performance abrasive cut-off machine with associated equipment for upgrading the existing bar mill in Sriracha, Chonburi to allow rolling SBQ products with perfectly cut ends was successfully executed. As part of this contract, BRAUN has also done the complete engineering for the modifications of the existing rolling mill equipment required for the implementation of the new cutting facility.



BRAUN cut-off machine type TS 12 F for upgrading NTS / TATA's existing bar mill in Chonburi.

**BRAUN at the Austrian group stand (booth H 14):**

“INDOMETAL 2014” will be an excellent opportunity for customers in Indonesia and neighboring countries to meet BRAUN's key experts and BRAUN's Indonesian representatives, PT. WIN Electroindo Heat to learn more about BRAUN's innovative range of products and services for the metal industry.



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*E-Mail: sales@win-therm.com*

*Web: www.win-therm.com*



Elkem Foundry Products:

# Ductile Iron Structural Definitions and Defect Analysis

## Introduction

Since its discovery in the 1940's Ductile Iron has become one of the most widely used iron alloys in the world, however, as with all irons the production of ductile iron is not without its problems as foundries need to have strict control on the raw materials and process to ensure defect free castings.

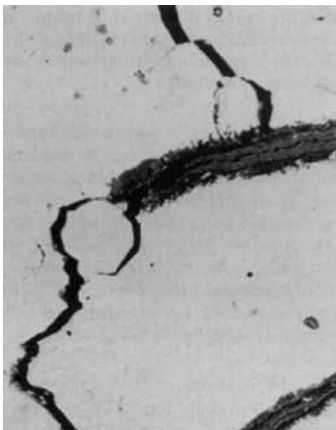
Over many years of working with ductile iron producers Elkem have cataloged many common problems associated with the production of ductile iron castings, the objective of this paper is to share information on common defects and to give some suggestive remedial actions that have been found to resolve issues with defects.

It is important that the foundryman understands the different components of the structures present in ductile iron as this will help him judge the quality of the castings he produces, as is well known a scrap casting will only generate a negative return for the foundry, as margins in general are small it is important that scrap rates are kept very low with zero scrap being the goal of all foundries.

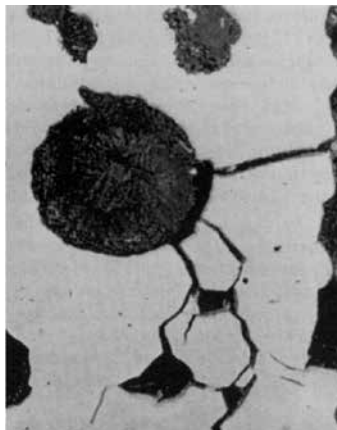
## Part 1 Structural definitions

### Graphite

This is the stable form of pure carbon in cast iron. It's important physical properties are low density, low hardness and high thermal conductivity and lubricity. Graphite shape, which can range from flake to spherical, plays a significant role in determining the mechanical properties of cast irons. Graphite flakes act like cracks in the iron matrix, while graphite spheroids act like „crack arresters“, giving the respective irons dramatically different mechanical properties.



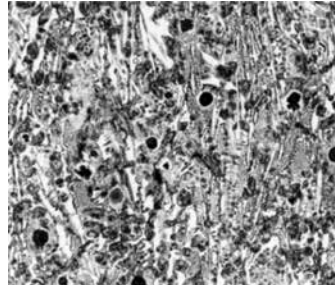
Micrograph of Gray Iron showing crack-like behaviour of graphite flakes.



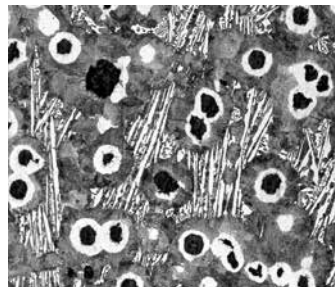
Micrograph of Ductile Iron showing how graphite spheroids can act as „crack-arresters“.

### Carbide

Carbide, or cementite, is an extremely hard, brittle compound of carbon with either iron or strong carbide forming elements, such as chromium, vanadium or molybdenum. Massive carbides increase the wear resistance of cast iron, but make it brittle and very difficult to machine. Dispersed carbides in either lamellar or spherical forms play an important role in providing strength and wear resistance in as-cast pearlitic and heat-treated irons.



Uninoculated ductile iron showing.



Intercellular iron carbides.

### Ferrite

This is the purest iron phase in a cast iron. In conventional Ductile Iron ferrite produces lower strength and hardness, but high ductility and toughness.

### Pearlite

Pearlite, produced by a eutectoid reaction, is an intimate mixture of lamellar cementite in a matrix of ferrite. A common constituent of cast irons, pearlite provides a combination of higher strength and with a corresponding reduction in ductility which meets the requirements of many engineering applications.

### Martensite

Martensite is a supersaturated solid solution of carbon in iron produced by rapid cooling. It is very hard and brittle.

### Bainite

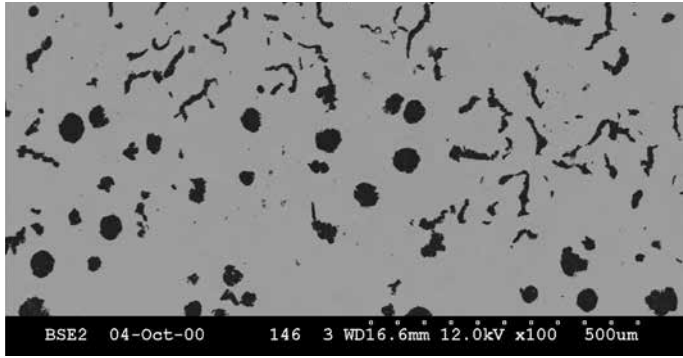
Bainite is a mixture of ferrite and carbide, which is produced by alloying or heat treatment.

### Austenite

Normally a high temperature phase consisting of carbon dissolved in iron, it can exist at room temperature in austenitic and austempered cast irons. In austenitic irons, austenite is stabilized by nickel in the range 18-36%. In austempered irons, austenite is produced by a combination of rapid cooling which suppresses the formation of pearlite and the super-saturation of carbon during austempering, which depresses the start of the austenite-to-martensite transformation far below room temperature. In austenitic irons, the austenite matrix provides ductility and toughness at all temperatures, corrosion resistance and good high temperature properties, especially under thermal cycling conditions. In austempered Ductile Iron stabilized austenite, in volume fractions up to 40% in lower strength grades, improves toughness and ductility and response to surface treatments such as fillet rolling.

**Part 2 Common Defects**

**Compacted Graphite In Ductile Iron**

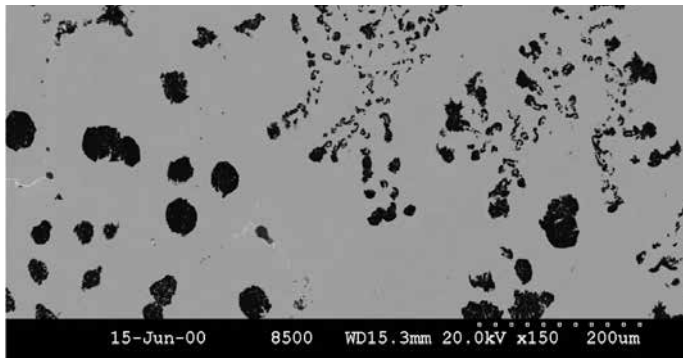


- Low nodulariser levels Mg and/or RE
- High S in base iron
- Long holding times
- Poor Inoculation
- Contamination of the iron with elements such as Ti

**In order to correct the defect the following suggestive actions are suggested**

- Increase residual Mg and /or RE levels
- Reduce S in base iron
- Reduce Holding time after nodularisation
- Better inoculation
- Check on Ti contamination from CGI returns or pig iron
- Check composition of the steel scrap to ensure trace elements are low

**Chunky Graphite**



Of all the theories Carbon super-saturation and super-cooling fits best with where chunky graphite is located and the transition from areas with chunky to spheroidal graphite.

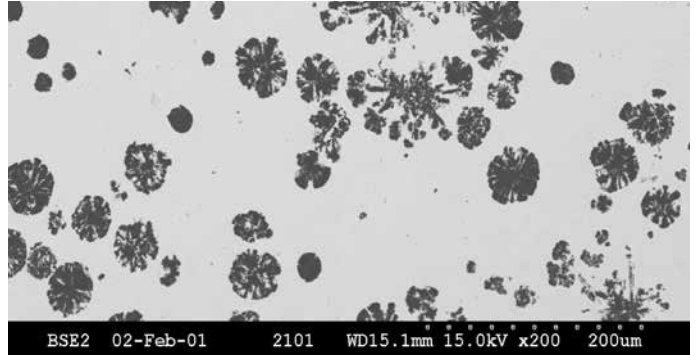
While most theories also mention CEV and pouring temperature as important factors influencing presence of chunky graphite, the carbon super-saturation and super-cooling theory offers a logical connection between them.

**Suggested Corrective Actions**

- Adjustment carbon equivalent to section size and cooling rate
  - carbon equivalent in the range of 4.3 – 4.5
  - Si in the range of 2.0 – 2.2%
  - pay special attention to the elements Si, Ni, Ca
- Controlled addition of elements such as Sb, Sn, Cu, Mn
  - 0.002 – 0.005% Sb is often used to balance RE 0.002 – 0.005%RE
- Reduce or adjust content of RE
  - less is better than zero in most cases
  - RE important to improve nucleation potential
- Improve inoculation to reduce segregation effects of RE's

- Increase pouring temperature
- Improved or adjust inoculation
  - choice of inoculant can be important to reduce needed addition
  - multiple steps can also help reduce overall needed addition
  - avoid too low S-levels (> 0.005%)
  - Improve inoculation to reduce segregation effects of RE's
- Reduce or adjust residual Mg-content
- Reduce hot spot areas in casting

**Exploded Graphite**



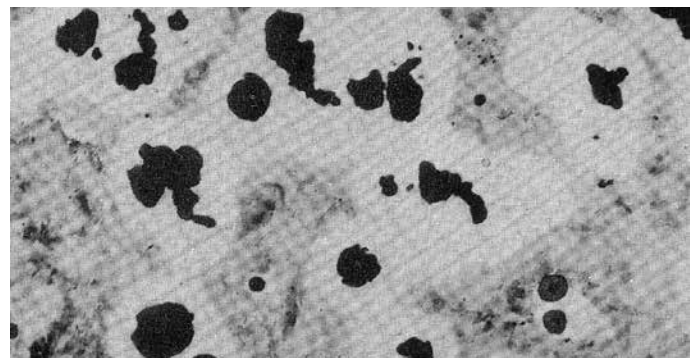
**Causes**

- Excessive Carbon Equivalent
- Often seen in connection with flotation
- Excess RE vs. sulphur and/or subversive trace elements content
- found in high carbon equivalent irons produced from pure charge materials

**Suggested remedial actions**

- reduce carbon equivalent
- increase cooling rate
- reduce RE content in nodulariser or reduce addition rate of nodulariser
- reduce RE vs. sulphur ratio

**Irregular Graphite**



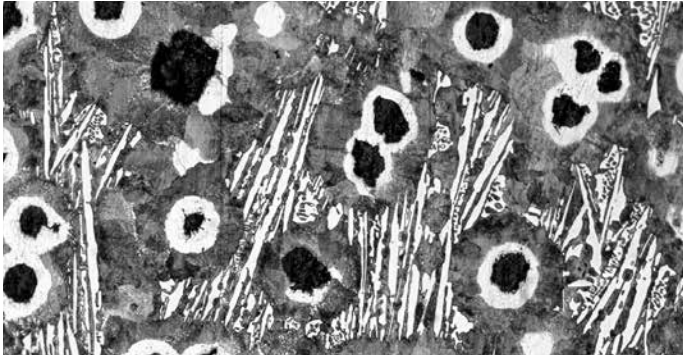
**Probable Causes**

- insufficient inoculation
- long hold times after inoculation (fading)

**Suggested remedial actions**

- improve inoculation
- avoid long hold times after inoculation
- Use a second, late addition of inoculant
- increase magnesium addition

**Intercellular Iron Carbides (Chill)**



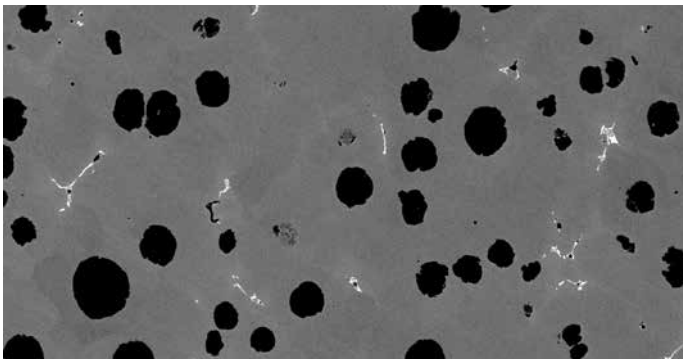
**Probable Causes**

- too low carbon equivalent and/or silicon content
- excess Mg and/or RE content
- excess content of carbide promoting traces (Mn, Cr, V, Mo, etc.)
- insufficient inoculation
- tellurium cups in charge
- low pouring temperature

**Suggested remedial actions**

- increase carbon equivalent and/or silicon content
- reduce Mg and/or RE content
- reduce content of carbide promoting traces (Mn, Cr, V, Mo, etc.)
- better inoculation
- avoid tellurium cups in charge
- increase pouring temperature

**Segregation Carbides**



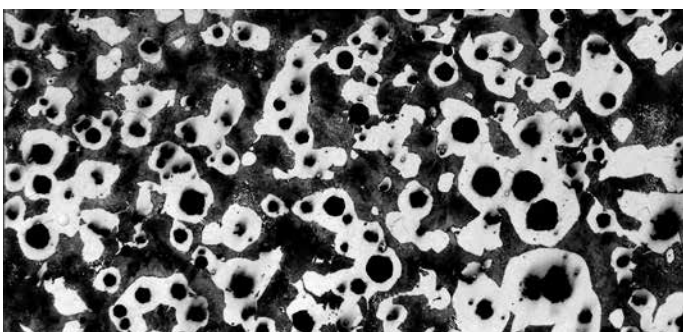
**Probable Causes**

- excess content of carbide forming traces (Cr, V, Mo, etc.)
- insufficient inoculation
- low RE/Mg ratio in nodulariser

**Suggested remedial actions**

- reduce content of carbide forming traces (Cr, V, Mo, etc.)
- better inoculation to minimise segregation
- change nodulariser to improve nucleation

**Low Ferrite/Pearlite Ratio**



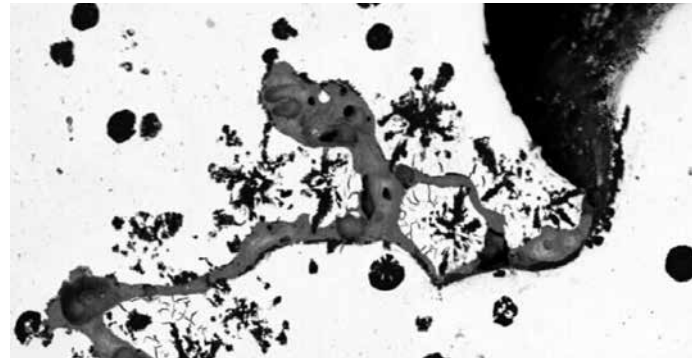
**Probable Causes**

- excess content of pearlite stabilising elements (Mn, Cu, Sn, Sb....)
- insufficient inoculation
- too low Silicon content
- hot shake out

**Suggested Remedial Actions**

- reduce content of pearlite stabilising elements (Mn, Cu, Sn, Sb....)
- use more high purity charge materials (pig iron)
- better inoculation
- increase Silicon content
- avoid hot shake out

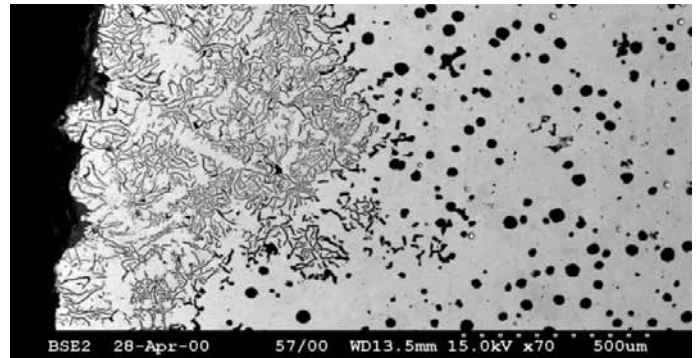
**Slag Inclusions**



**Suggested remedial Actions**

- improve de-slagging practice
- empty ladle between treatments
- improve pouring practice
- improve gating design to reduce turbulence
- use filter or slag traps
- reduce Mg / nodulariser addition

**Flake Graphite Structure**



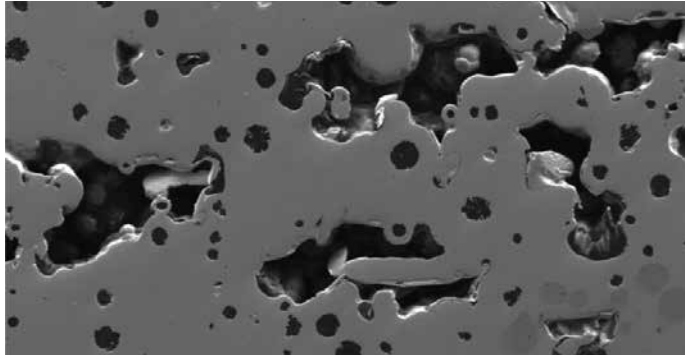
**Possible Causes**

- excess sulphur in moulding sand
- long runner systems
- high pouring temperature

**Suggested remedial Actions**

- reduce sulphur in the sand
- increase Mg or Mg/S ratio
- avoid use of long runner-systems
- reduce pouring temperature
- increase pouring rate
- use RE-containing inoculant

**Shrinkage Porosity**



**Possible Causes**

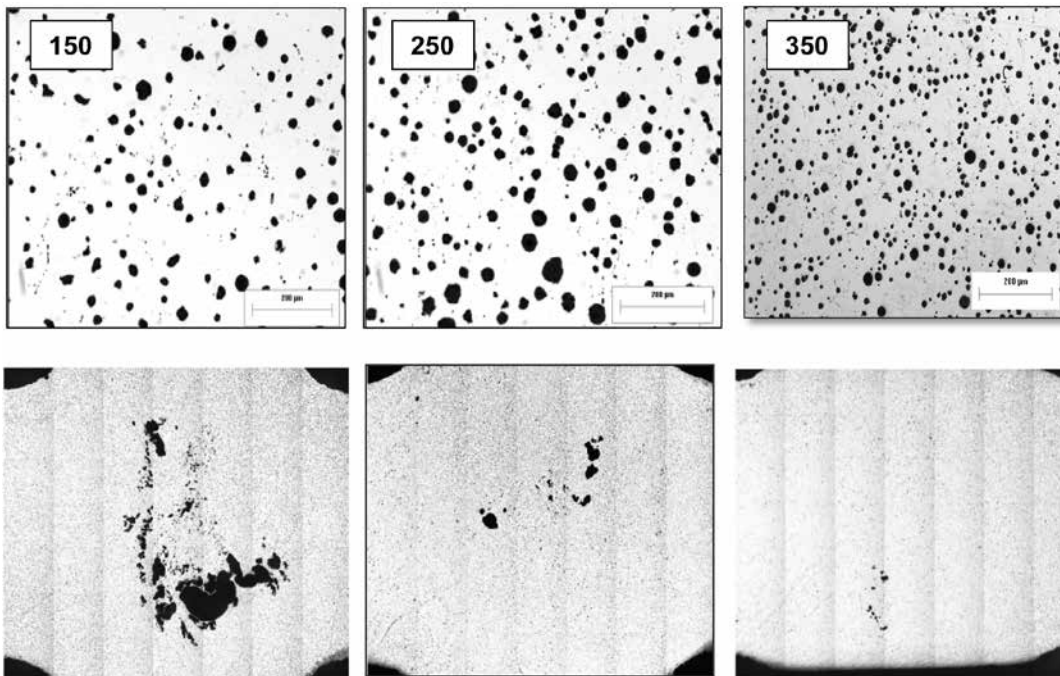
- insufficient mould strength
- inadequate gating and feeding design

- too low carbon equivalent
- excess magnesium addition
- excess alloying contents
- insufficient inoculant
- time between inoculation and pouring too long

**Suggested Remedial Actions**

- increase mould strength
- improve gating and feeding design
- Increase Carbon
- reduce Magnesium addition
- reduce alloying contents
- use better inoculant
- reduce inoculation fade time
- Keep CE as close to 4.3% as possible

**Nodules and Shrinkage**



It is has been found that at low nodule counts the possibility of shrinkage increases, this does show that the nucleation characteristics combined with the correct inoculants addition can significantly increase the nodule count which it has been found will have a positive effect on the shrinkage tendencies of the casting.

**Gross Shrinkage**

**Reduced Shrinkage**

**Micro Porosity**

**Conclusions**

While there are many defects that can be found in ductile iron what we have tried to show are the most common type that foundries can and do experience, the following areas should be controlled which can help improve the casting quality.

**To avoid metallurgical defects in ductile iron the following must be emphasised:**

- use good quality raw materials with low contents of trace elements (Mn, S, V, Mo, Ti, Cr.....)
- use a consistent treatment process giving reproducible analyses, high recoveries and good temperature efficiency
- use high quality nodularisers with consistent analyses and sizing
- use high quality inoculants specific to the requirements



**For more information, please contact:**

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ASK Chemicals – We advance your casting

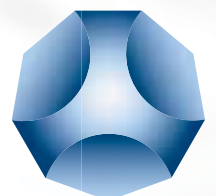


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FOCHEM international extends and optimises Product portfolio:

## Dry Casting Lubricants – Plunger beads

It is our great pleasure to introduce our latest generation of beads as dry plunger lubricant with revolutionised lubricating qualities. Our state-of-the-art manufacturing plant is now in operation. Based on 40 years of Research & Development, as well as feedback from our customers, we can claim that our products are today considered the most advanced on the international Die-Casting market.

### White beads – plunger lubricant, containing white pigments

Our newest development, Isolat 95W, is a valuable asset in addition to our product portfolio. These “white beads” offer excellent lubricating properties due to a solid content of approx. 20%, consisting of a unique mixture of micronised white lubrication pigments. Due to this high solid content, the quantity per shot can be reduced significantly, in comparison to white beads without solids. The congealing point of Isolat 95W is >95°C. The bulk density ranges from 0.55-0.65, depending on the fraction.

To meet customers' requirements, Isolat 95W is available in different sizes:

Product	solid content	available sizes	Properties
Isolat 95 W	18-21 %	0,3 – 0,9 mm 0,9 – 1,6 mm 1,6 – 2,0 mm	White beads with ideal melting properties

FOCHEM international's product portfolio comprises several graphite-based beads and white beads:

Product	solid content	available sizes	Properties
Isolat 80 G	17-20 %	Dust 0,2 – 0,5 mm 0,5 – 1,0 mm 1,0 – 1,6 mm 1,6 – 2,0 mm 2,0 – 3,0 mm	
Isolat 70 G	8-11 %	Dust 0,2 – 0,5 mm 0,5 – 1,0 mm 0,5 – 1,6 mm 1,0 – 1,6 mm 1,6 – 2,0 mm 2,0 – 3,0 mm	Dry plunger lubricant based on exceptionally smooth graphite of very high purity
Isolat 60 G	4-6 %	Dust 0,2 – 0,5 mm 0,5 – 1,0 mm 0,5 – 1,6 mm 1,0 – 1,6 mm 1,6 – 2,0 mm 2,0 – 3,0 mm	
Isolat 80 W	N/A	2,0 – 3,0 mm 2,0 – 4,0 mm	White beads with ideal melting properties



### Advantages of FOCHEM international beads

- Perfectly round
- High melting point synthetic wax
- Environmentally friendly
- Free-flowing, anti-static, and dust-free
- Suitable for tropical conditions
- No clogging of dispenser unit required
- Prolonged life of plunger
- Effective protection of the shot sleeve against aluminium erosion
- Minimisation of casting porosity
- Only small amounts required

### FOCHEM international Dispenser 3D

We strongly recommend to use the FOCHEM international “Beads Dispenser 3D” in conjunction with our beads. The “Beads Dispenser 3D” is a digital beads dosing machine offered to the Die-Casting industry, manufactured by our associate company TRIBO-CHEMIE GmbH in Germany. It is equipped with a technologically advanced dosing head, providing extremely accurate process assurance. The entire operation of the “Beads Dispenser 3D” is reliable, precise and the work environment remains clean.

South Africa, as a member of the BRICS association, sells products in Russia through an agent. In other countries, where no representation is in place, our products can be ordered directly from FOCHEM international, South Africa.

Do you have any questions or requests? Do not hesitate to contact us, we will gladly advise you.



#### For more information, please contact:

*Fochem International (Pty) Ltd.*  
 Postal address: 10 Barium Street, Alrode, 1450, South Africa  
 Phone: + 27 11 903 9720  
 Fax: + 27 11 903 9730  
 E-Mail: info@fochem-international.com  
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A GLOBAL PARTNER FOR A GLOBAL FOUNDRY



**Complete No-Bake moulding systems • Core-making machines and robot operated core centers • Shot-blasting, shot-peening and dry-pickling machines • Pipe Handling plants**

During over 40 years of successful participation in the foundry market, IMF has always based its product strategies on its ability to act as a technology partner alongside its Customers. This continuous cooperation with casting producers has stimulated the growth of technologically advanced complete moulding and sand reclamation systems, core shooting and shot-blasting machines.



**IMFGROUP**  
WILL BE AT  
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IMF  
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**FOUNDRY**  
AUTOMATION



carlo  
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## Air hoists handle difficult Foundry conditions

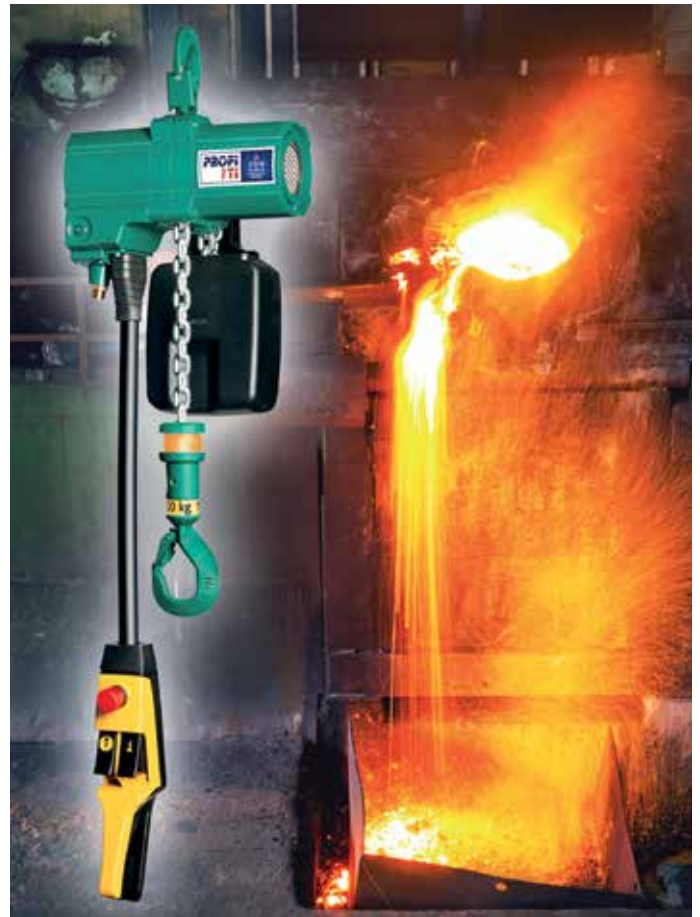
Foundry operating conditions can involve intense heat and noise combined with dust and chemically-laden atmospheres, resulting in some of the most difficult and potentially dangerous working environments. Add to this the need to move and manually manipulate heavy loads, then you have tough conditions that demand the very best, not only from tools and equipment, but also from the workforce. The range of air operated hoists manufactured by J D Neuhaus have been designed to provide safe and reliable load handling facilities, with 100% duty ratings and minimum downtimes to maintain maximum production efficiency, no matter how difficult the working conditions. The absence of any electrical or electronic equipment, combined with highly robust air-vane motors ensures that the JDN range of hoists are suitable for operation even in potentially explosive atmospheres.

With workplace safety being paramount, the hoists also provide a high degree of lift, lower and load positioning control to ensure full compliance with prevailing working practice regulations. Typical operations encountered within foundries include the handling of raw materials (sand and scrap metals etc), lifting moulds and cores for stacking or storage, handling molten metal ladles, mould shakeouts and sand reclamation, shot blast and grinding operations in cleaning areas, together with final machining, painting and product packing operations. With individual castings varying in their size and weight from under 1kg to several metric tonnes, JDN hoists are currently being successfully utilised in all areas of the foundry operations with varying individual hoists providing load handling requirements from 125kg up to 25 tonnes or more.

The Mini series of JDN hoists can be supplied for load capacities of 125, 250, 500 and 980kg. These compact, lightweight hoists can be supplied with manual trolleys for overhead rail mounting to accommodate load traversing operations. A Mini Manipulator version can also be provided where single handed load handling and positioning can be safely undertaken.

For heavier handling requirements the rugged JDN Profi TI product range has been widely utilised for this market. These hoists are suitable for operation in the toughest industrial situations, providing individual lift requirements from 250kg up to a full 100 tonnes if required. All the JDN products are insensitive to humidity, dust and temperatures within a range of -20°C to +70°C (mini +50°C).

A J D Neuhaus air operated Profi 1 TI with a one tonne lift capacity, suitable for operation in typical hot and dust laden atmospheric conditions.



**J·D·NEUHAUS**  
1745 **engineered for extremes**

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The Foundry-Asean Magazine was solely printed for the Indometal – International Metal & Steel Trade Fair for Southeast Asia

The digital version can be found on: [www.Foundry-Asean.com](http://www.Foundry-Asean.com)

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Example of Laempe core centers

Laempe & Mössner:

## World market leader for core shop equipment

### The Company

Laempe & Mössner GmbH is a German based international supplier of core shooters and solutions for core shops in the foundry industry. Present in all relevant branches, like e.g. automotive, fittings or railway, Laempe covers all areas, with its full range, in which core making shops exist. State-of-the-art production equipment and technologies assure the quality of our systems, whilst high flexibility characterizes our production and logistics. Fundamental for our success are our qualified and motivated employees. Laempe engages more than 330 employees worldwide and on two German locations in Barleben (Headquarter) and Schopfheim. With exceeding 25 representatives worldwide as well as direct distribution Laempe gains an annual turnover of 70 million Euros.



Laempe provides machines and equipment for all requirements from low volume production to high volume automotive equipment

### The Products

#### Core Shooters and Peripheral Equipment

Laempe & Mössner provides core shooters for all standard core sand processes, cold, hot and combined processes, like PU-cold-box, SO<sub>2</sub>- and MF-curing binders, CO<sub>2</sub>-curing waterglass and resol binders, hotbox, solid shell core and inorganic binders. Additionally to the basic core shooters Laempe & Mössner provides all necessary equipment to run core shop including sand mixing systems with sand and binder supplies, gas generators and intelligent automation solutions for turnkey installations. Besides this



hardware equipment Laempe & Mössner offers a tailor made software solutions to monitor and control the production equipment in the most efficient way.

### The Capabilities and the People

Laempe & Mössner covers a great experience in core shooting since the year 1951 including the merged companies Hottinger and Röperwerk. More than 15.000 core shooting machines, long term customer relationship and continuous contacts to foundries, binder suppliers, pattern makers and universities guarantee deep know how and best customer care. Laempe & Mössner experienced staff serves the foundries by offering service, spare parts and consulting for production. Visit us at Indometal 2014 on stall No. L26.



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IMF Group:

## Inside the Italian collective of ITA

**In the planning 2015 of international exhibitions, IMF has included the participation to INDOMETAL 2014 in Jakarta, being this exhibition for the foundry and located in a Country considered very important. IMF will be pleased to welcome the Customers at booth L01, inside the Italian collective of ITA (Italian Trade Agency).**

Founded in 1972, IMF is now an international Group engaging 500 people, in five Production Units located in strategic Countries, i.e. Italy, Czech Republic, China, Brazil, France and three Representative Offices in Russia, India and USA, which can assure a big production capacity and rapid answers to the Customers, thanks also to the After Sale Service organization. Furthermore a large net of qualified Agents in more than forty countries strengthen the

presence of IMF and helps in assisting the Customers worldwide. IMF has based his success mainly in three strategic elements: the acquired know-how, the professionalism of the employees and the important innovation capability. The big number of IMF references all over the world is the result of a high production quality and of a qualified service performed.

In particular the foundry equipment sector is the core business of IMF, including a full range of products: stand-alone machines up to complete foundries on turn-key projects for the production of a many kinds of castings. The projects are developed inside the Group by a team of experts, capable to follow the projects up to the starting of production.

Thanks also to the acquisitions of Banfi and Foundry Automation, IMF Group nowadays is composed of five Divisions and can propose to the Customers a wide range of products including:

- Foundry Equipment Division including: continuous mixers, roll-overs, fast loops, coating systems, core setting lines and closing lines, shake-outs, tele-manipulators, mechanical and thermal reclamation systems, pneumatic transports.

- Core shooting Machines Division including: core shooting machines for cold-box, hot box and croning processes, preparation plants for core sand, robotized centers for the production of complete core packages with high automation level, most suitable for the big series production for the automotive sector.
- Shot-Blasting Machines Division including: shot-blasting, shot peening, dry-pickling machines for the treatment of metallic surfaces for the foundry and also for different industrial sectors.
- Pipe Handling Division including: finishing handling lines for pipe transportation of casing, gas/oil line pipe, heat treatment lines.
- Bulk handling Division including: belt transport system for heavy materials.

# IMFGROUP

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Italtipresse supply automatic work cells that integrate all peripheral devices, from the furnace to automatic deburring with the arrangement of pieces ready for machining. The range includes high pressure die casting machines with three and two platen (toggle free). The support goes from consultancy to process design, manufacture, construction or procurement and integration of different peripheral devices, as sole supplier and company responsible, assisting the customer in a flexible way, by supplying complete individual component turnkey cells or just the engineering.

The main market reference is the automotive industry having supplied machines and automatic work cells in almost all the world's major automotive companies, and all major OEM suppliers in the industry. The machines and the cells are designed and manufactured specifically for the application: lubrication with dedicated head, a single robot or two robots, automatic removal of the sprue with deburring die or band saw, loading and handling of inserts (cold or pre heated) secondary or ancillary processing (heat treatment, shot blasting, deburring), also in partnership with die ma-

kers to optimise the cycle time and die design. We pay particular attention to the energy recovery: giving energy only when needed, saving in the oil cooling of the machine, with the reduction of noise, the reduction of the maintenance costs, as well as the reduction of the installed power supply.

Nowadays the automotive Industry, the experienced casters all over the world, and the high-end use of the castings they all require even higher repeatability, higher availability of the equipment, higher casting quality and complexity, lower scraps, control and tractability of the castings, flexibility, shortest cycle times, energy saving, and we can meet these requirements. And Italtipresse is a key supplier to meet all these requirements.



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Hüttenes-Albertus Group:

## Strong Partners in Southeast Asia

The South-East Asian markets develop rapidly and steadily and have a huge casting potential. The ongoing liberalisation and opening-up of the markets makes it possible for international companies to participate more actively in Southeast Asian countries. It is crucial that products, which require a high degree of knowledge and experience, such as foundry chemicals, are accompanied by a comprehensive consultation and regional service and support.

Via its Asian affiliates the Hüttenes-Albertus Group has been present in the Asia-Pacific region for years, and is now extremely pleased to have found two competent partners to assist in supporting customers in Indonesia, Malaysia and Thailand.

PT. Akbar Budi Sakti will represent the HA Group in Indonesia and Centre West Foundry Supplies SDN, BHD is the partner company in Malaysia.

Gary Weber, Director of HA Australia and representative for the Southeast Asian region is convinced: "By combining the many years of experience of our partners within the regional foundry markets and the know-how and service from HA, we are able to satisfy the demand for technologically and ecologically improved foundry chemicals within this region."

### About the partners

The Hüttenes-Albertus Group is an internationally operating group of companies. The headquarters are in Germany and almost 40 affiliates and partner companies supply and support foundries worldwide with advanced chemical products for ferrous and non-ferrous casting. The product portfolio includes Cold-Box, Hot-Box and No-Bake binder systems, inorganic binders, water and alcohol-based coatings, resin coated sand, release agents and other foundry auxiliaries.

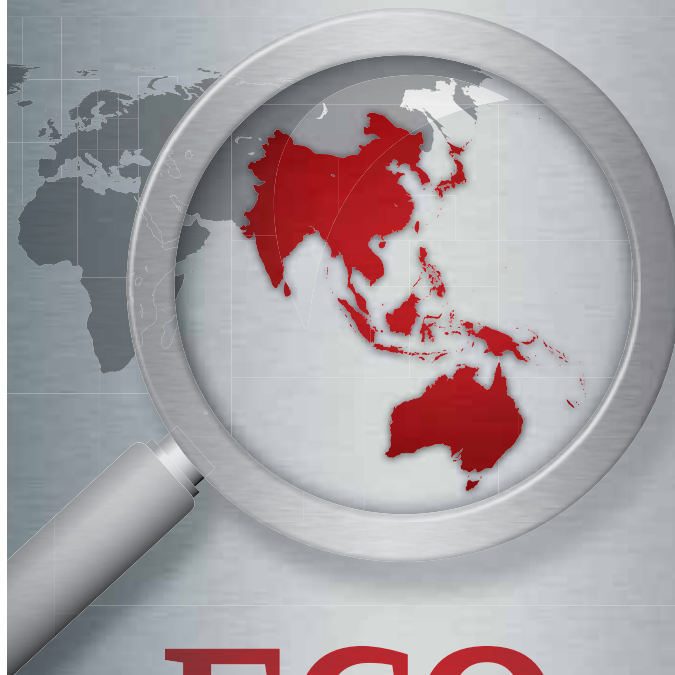
PT. Akbar Budi Sakti was established in 2002 in Jakarta and first traded billets for steel mills. From 2006 onwards they extended their services by supplying foundries and steel mills with high-quality materials.

Centre West Foundry Supplies SDN, BHD is a specialist in the marketing and distribution of ferro alloys and raw materials to steel and iron foundries in the SEA region.



### For more information, please contact:

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# ECO-FRIENDLY FOUNDRY CHEMISTRY



## HUETTENES- ALBERTUS.COM



Top:  
Strength testing device SJ1

right:  
Gas permeability device GJ1



Universal Sand  
Testing Machine

Jung Instruments GmbH:

## Sand Test Instrument - Universal molding sand testing machine

### Innovation in Moulding Material Testing:

Our new sand test instrument helps you to work more accurately, to create less rejects on raw material and thus keep your costs at a minimum. At the same time, it is easy to handle and robust in construction.

### One Instrument for All Tests:

The comprehensive options for measurement together with a high reproducibility of your measurements and the analysis of mechanical-technological parameters reduces your work to a fraction of its original amount. Due to its all comprising functionalities, it replaces an entire sand test lab which makes it on top of that also a space saver.

### Benefits and Specifications:

- robust
- space-saving
- automatical testing
- adjustable / variable testing speed
- high reproducibility
- time saving
- simple / uncomplicated handling
- user friendly
- security system provided
- precise calculation of analysis results
- fast change-over at testing

### Analysis Options:

- reference block constructions (forming pressure adjustable according to needs e.g. to operating parameters from the industry)
- compression strength
- splitting resistance
- shear strength

- double-shear strength
- dry compression strength
- green tensile strength
- flexural strength
- tension / strain curve
- compactibility
- shear / elasticity module (detection possible)
- wet tensile strength
- flowability

### Technical Parameter:

- universal testing machine with ball spindle drive
- robust suitable for industrial constructions
- testing machine designed for force up to 10 kN
- maximum test load with 5 kN
- maximum testing speed with 500 mm / min
- machine also manual controllable
- fanless Industry-PC
- handling by Touchscreen
- raw data of each measurement completely available
- Electrical supply data 230V / 50 Hz

### Optional:

- connection of a balance to determine the water content in molded materials
- Network
- local printer



### For more information, please contact:

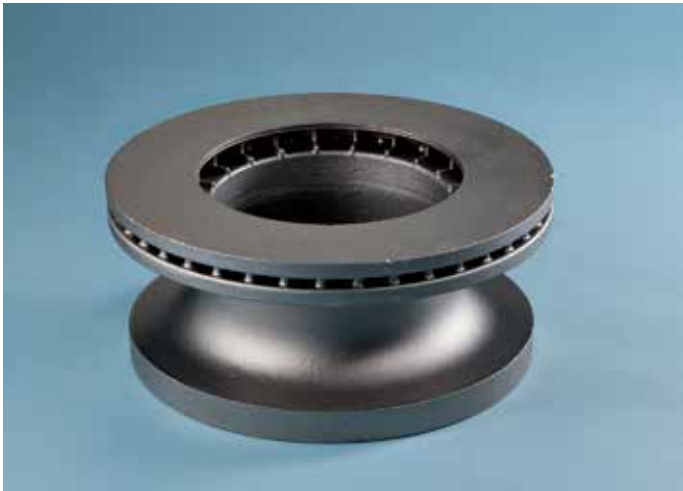
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## Perfect shapes, perfect products

- Release agents and lubricants for high-pressure die-casting
- Forging lubricants
- Coatings for the deformation of metals
- Chemical research and development for industry





Picture 1: On DISAMATIC produced truck brake disc with diameter of 19"

DISA Group:

## Brake disc production – is optimization possible?

**Each year brings new records in global vehicle sales. These do not apply equally to all parts of the world, however. New auto manufacturers are moving into the world market beside established names with a view to exporting from their home markets. And all auto manufacturers producing vehicles in other markets than their domestic market are expecting their suppliers to deliver locally.**

Saturation in domestic markets has led to unused production capacity in industrialized countries. Prices are increasingly under pressure as competition grows. Auto manufacturers pass the consequences on to their suppliers, including foundries making automotive components. Thus especially manufacturers of brake discs and drums are forced to develop new strategies.

The extreme and constant pressure on the foundry industry is anything but new. It is remarkable how production is repeatedly scrutinized in detail and how efforts are made all the time to optimize every single process in the foundry. There are, however, some fundamental decisions that almost seem to have "religious" roots. Once a moulding process has been decided it is unshakeable. Truths and rumours about the various moulding processes vary and are often mixed together.

An extremely obscure aftermarket means that there are no detailed data about worldwide sales of brake discs. Based on our own market data as well as information from automotive system suppliers, it is estimated that about 6.5 million tons of brake disks are made every year worldwide. This output comes from vertical

parted flaskless moulding lines, horizontal parted flask and flaskless moulding lines, and floor moulding. Currently 149 DISAMATIC- and 6 DISA MATCH moulding lines at 91 foundries are making their contribution. The share of world production of discs and brake drums on DISAMATIC lines is currently around 3.5 million tons per year (Figure 1). Table 1 below shows the DISAMATIC share of production of these castings.

Of the last 50 moulding lines commissioned for the production of brake discs, two thirds went to Asia, providing a clear sign of where the market is still growing. Investment costs and future operational costs carry most weight in new investment decisions.

### Investment costs

Foundation costs are easily overlooked in the initial calculation, as plant supplier quotations do not include civil works. In many cases a simple foundation plate with a surface deviation of + / - 20 mm is sufficient for the vertical moulding process. The maximum deflection should not exceed 0.1 mm, as this could have an influence on the mismatch. As there is no need for pits below the moulding line, so the required maximum bending plays a subordinate role when installing on natural floor.

The simple and space-saving design of vertical moulding lines offers further cost advantages, some of which may only become apparent at second glance. The great advantage of vertical moulding technology comes from simultaneous moulding of the two mould halves into a sand mould and their immediate merging with the previous mould. This creates a very high production density on the foundry floor. This value is easy to quantify by examining the relationship between the annual production yield capacity and the area required for the moulding line plus service areas. The calculation of the underlying surfaces is shown in Figure 2. In addition to the surface area of the DISAMATIC moulding plant itself, service areas must also be taken into account. Moulding lines developed by DISA for the production of brake discs achieve an annual production yield capacity of more than 100 t/m<sup>2</sup>. Horizontally parted high-performance lines with two single or twin type moulding machines can only achieve about two thirds of this capacity, even when using multi-floor cooling houses.

### Energy savings

The reduction of energy consumption in the foundry has played an important role for many years. Until now discussions have focused on reducing energy consumption in the melting shop where consumption is highest. While the moulding section may "only" account for about 8 to 12% of production [1], there is still a significant savings potential to be found. Moulding shop energy consumption is split between the sand plant and the moulding line. Depending on the type of moulding technology employed, the moulding line will account for between 30 and 55% of moulding shop energy consumption.

Systematic use of robust vertical moulding lines based on lightweight design criteria reduces energy consumption significantly (Table 2). Here, too, it is a good idea to address quantifying average

Table 1: The moulding machine preference for brake disk production varies from continent to continent

	Europe	North America	South America	Middle East	Africa	Asia
DISA 230/2013	24	20	15	1	2	43
DISA 240/250/2130	5	9	3			9
DISA 270/2070	5	4	2			
DISAMATIC 2110						7
Total	34	33	20	1	2	59



annual consumption based on kWh per ton of yield. The drive for increased efficiency demands working in three shifts. Here we can set off annual production hours and actual energy consumption of the moulding line (moulding machine, core setter, as well as the pouring and cooling lines) against net production showing a definite potential for a consumption of less than 10 kWh / t. Given this result, the DISAMATIC vertical moulding process has nothing to fear when compared with other moulding processes and energy consumption is only about 20% of that of flask lines.

**Table 2: electrical power consumption of DISAMATIC moulding lines**

	Average power consumption in kW	Connected load in kVA
DISA 231	55	85
DISA 231 fast	60	85
DISA 240	75	105
DISA 250	90	145
DISA 270	110	155

The production of brake discs and brake drums requires the highest possible capacity at low cost. The DISAMATIC moulding process fulfils these requirements more than any other. The machine construction is simple and requires at most only two drives: one for the moulding machine and the other for the pouring and cooling lines. Vertical parting of moulds enables placement of the gating system, as well as venting of the mould cavities, in the parting line. Other systems or sources of disturbance such as venting and drilling devices are not necessary. Production normally requires only one cooling line, thus eliminating the need for crossovers and the drives required by these as well. The absence of flasks means there is no need for mould punch out, thus simplifying separation from the greensand. Neither is there a need for recirculation and cleaning of pallets and flasks. The array of additional machines and tools required by tight flask lines mean higher investment costs, which in some cases can amount to the investment costs of a DISAMATIC line, and that must be taken into account when determining the cost per casting. The interference levels imposed by these machines and drives also point to higher uptime of vertical parted flaskless systems.

Ongoing service and spare parts costs vary from foundry to foundry, but can be roughly estimated to account for about 3% of annual investment costs based on external purchasing. While the percentage amount is likely to be similar for each process, the absolute cost burden is certainly not the same.

When considering investment costs, production intensity, resource consumption, uptime and maintenance are all clearly cost advantages for vertical moulding technology. Another area that is at least as important is the application technology that determines net production, castings quality and mould surface texture.

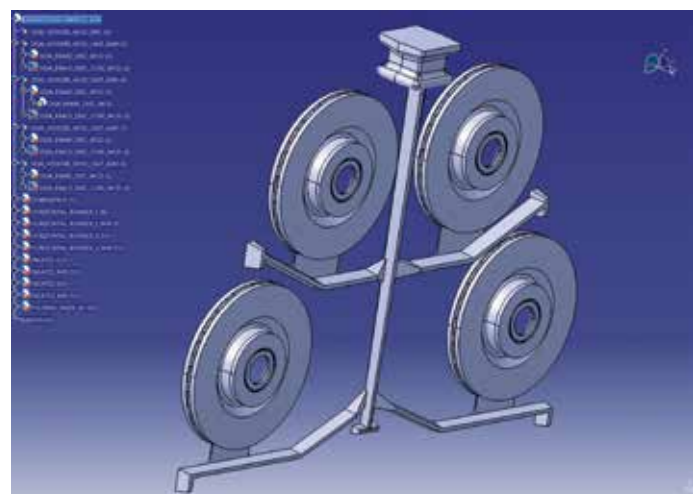
**Application**

One of the major benefits of the DISAMATIC is its high speed. On the other hand, high speed demands as very short mould pouring cycle time. The advantage of high speed combined with mould pouring required a correspondingly large-size gating system that reduced yield. Higher pouring speeds could be a reason for higher scrap rates. At GIFA 2011 a system was introduced that double indexed the mould string, thus extending the holding time by simultaneous pouring of two moulds. At the same time, several suppliers were offering pouring solutions that enabled foundries to make use of the advantages offered by the double index.

This development gives us an increase in performance that can be used in different ways. The longer pouring time can allow a reduction of the cross sections of the gating system, while freeing up space for additional castings or enabling improved cavity cutting. The longer holding time of the mould string and simultaneous pouring of two moulds can mean that pouring time limits the cycle time of the plant. Thus there is more time for additional moulds to be poured, resulting in a further reduction in the number of casting defects. In this way, a partial combination of the two advantages is possible. These advantages are shown in Table 3.

**Table 3: Example of the performance increase of a DISA 270-A using the double index**

	Single index	Double index I	Double index II
Amount of brake discs per mould	4	4	4
Brake disc diameter in mm	270	270	270
Weight per brake disc in kg	8.5	8.5	8.5
Pouring time in sec	10.4	13.3	13.3
Pouring speed in kg/sec	~4.5	~3.5	~4.5
Yield in %	~79	~82.5	~79
Weight of the cluster in kg	~ 43.0	41.2	~43.0
Necessary melting capacity t/h	~12.5	~13.3	~15.9
Brake discs per hour	1160	1288	1480
Use of energy for moulding line kWh/t	12.4	10.0	9.7
Density of production t/m <sup>2</sup>	~95	~105	~120



Picture 3: Casting cluster of a DISA 270-A

Figure 3 shows the cluster forming the basis of the information in Table 3. The calculations for gating systems using a single index are similar to those for a double index. The differences lie in the

cross sections of the gating systems, which is however very difficult to see in the visual representation (Figure 3). By extending the pouring time using the double index from 10.4 to 13.3 seconds it was possible to reduce the pouring speed from 4.5 down to 3.5 kg/s. This meant among other things that the size of the pouring cup could be reduced from no. 5 to no. 4. The runner lengths and the cross sections of the gating system to the pattern could also be reduced. This enabled a 3.5% yield increase. At the same time, moulding capacity increased from 290 to 322 moulds per hour. However, pouring can also take place at 4.5 kg/s with a yield of 79%, thus increasing moulding capacity to 370 moulds per hour using double index.

Although the nature of the casting defects is fundamentally different in the production of brake discs using horizontal and vertical moulding processes, rejection rates are comparable. Microporosities occurring on vertical lines correspond to blowholes in horizontal lines. Any experienced foundry man is aware of these issues in the respective processes and knows how to rectify the problem.



Picture 4: Pattern plate of a DISA 240-C

There are no detectable differences after machining and mounting of brake discs in cars between the two production processes. A large globally active automotive company has confirmed that there are no qualitative differences in long-term operation between brake discs made using a vertical or horizontal process.

A common disadvantage, especially of larger DISAMATIC moulding lines, is ferrostatic pressure arising during pouring of the mould. These vertical moulding lines with mould heights of 700 and 800 mm have been present in foundries since 1977. In 1979, the first DISAMATIC 2070-A commenced operation in a brake discs foundry with mould dimensions of 700 x 950 mm. Thus, we have 35 years of experience with issues and solutions. The effects of ferrostatic pressure can be handled via the gating system, but there are limits. Mould heights of more than 800 mm are not recommended for brake disc production by moulding machine suppliers.

Double-sided squeezing of sand moulds via the pattern plates ensures maximum hardness on the mould surface, which decreases somewhat towards the centre of the mould. Meeting this natural process advantage of the vertical moulding process in a horizontal flask process requires integration of secondary filling frames with the pattern bolster. Secondary filling frames are used to increase mould stability in the boundary areas of the flasks and to ensure the desired low draft angles.

In tight flask lines, closing devices are required to close the cope and drag, however with the risk of mismatch by mechanically

determined clearance in the adjustments. Wear and tear of pins and bushings on all flasks must be continuously monitored. On the other hand, in vertical parted lines the finished mould will be pushed out of the mould chamber under the guidance of the pattern plate and placed in contact with the previous mould. This means that mismatch and consequent higher fettling requirements are significantly reduced.

In the vertical process, glued strips on the surface of the pattern plates ending at the top of the mould are sufficient for venting the mould cavity during the pouring process. Damage to the moulded cluster by subsequent piercing or drilling of vent holes is thus also eliminated.



Picture 5: Core Setting robot at DISAMATIC

### Greensand

The choice of mould technology also has a decisive influence on the green sand circuit. In the horizontal process the amount of sand can be regulated to a limited extent by over-squeezing the cope. Iron-sand ratios in the range from 1:3 to 1:12 are not uncommon. Problems with recooling and equalizing the sand in the sand plant are correspondingly serious. The resulting quality problems will considerably impact the production result. Used green sand should be optimally prepared at a temperature of 40°C.

Vertically parted mould systems with their adjustable mould thickness prove to be advantageous in this respect. The PLC of vertical moulding lines assumes a constant iron-sand ratio. The foundry can, however, take advantage of the low pattern height in brake disc production to make adjustments according to its own needs. In this case, however, the above range is not reached. This constant



Picture 6: Cores in green sand mould

ratio means that the thermal load on the mould sand is relatively uniform – an advantage for which any foundry quality department is grateful. Sand overflow that occurs in horizontal flask moulding equipment is practically non-existent in the vertical process, meaning that mould sand plants can be designed to be smaller, thus also reducing energy consumption.

**Experiences of Hyundai Sungwoo Automotive in South Korea**

The South Korean foundry Hyundai Sungwoo Automotive started production in May 1987 in Pohang / South Korea with a flask moulding system of dimensions 900 x 700 x250 / 250 mm. 410 employees work in an area of 60,000 square metres. The annual capacity of the foundry is 148,000 tons. In 2013, 121,000 tons of castings were produced, rising to 127,000 tons in 2014. The foundry produces automotive castings in GJL and GJS. The moulding machine was replaced in 2012, enabling a brake disc production cycle time of 15,2 seconds. In 2005, two DISA 240-C moulding machines with a mould size of 600 x 850 x 150 mm to 500 mm and a cycle time of 9.3 seconds were commissioned for brake disc production beside an additional flask moulding plant of the same size as the other with a cycle time of 20 seconds for other automotive castings. All plants producing brake discs are directly connected to cooling drums and continuous shot blast machines.

Similar production flow and about 4,500 hours production time at both plants in 2013 mean that the performance of the tight flask moulding plant and the older of the two DISA 240-C machines can be compared directly. Both systems make only brake discs, which however are distributed differently between the plants because of their dimensions.

The DISA 240-C features a rigid delivery system including a filter core for the transport of the cores to a core setting robot. Both the cores and the filter core are placed in fixed positions (Figures 4 and 5). Brake discs are manufactured in a range with diameters between 260 and 325 mm on the DISAMATIC in order to obtain acceptable system efficiency. The smaller discs, as well as a larger disc are made on the horizontal moulding line (pictures 7 and 8). The horizontal moulding line makes two large discs, or up to six small discs per mould box (Table 4), while the DISAMATIC always produces two discs per mould.

**Table 4: Comparison of production on horizontal and vertical plant in 2013**

Plant	Production t/y	Castings pieces/y	Scrap total	Moulding line related scrap
Tight flask line	42,000	4,128,592	30,703 (0.8%)	17,217 (0.40%)
DISAMATIC	43,000	3,433,961	24,576 (0,74%)	5,151 (0.15%)

The scrap produced by each moulding line arises as a result of the following sources of failure (Table 5).

**Table 5: Percentage distribution of the scrap of both moulding lines on basis of Table 4**

Plant	Sand inclusions	Mould cracks	Mismatch	Broken cores	Flash	Black skin
Tight flask line	76.55%	16.32%	0.2%	6.52%	0.37%	0.13%
DISAMATIC	93.32%	5.49%	0%	1.06%	0.11%	0%

The percentage of scrap caused by the moulding lines, however, comes very close to the desired zero error-production. A comparison of the yield of each plant and its scrap rate invites a comparison of uptime. Again, the Hyundai Sungwoo foundry is able to provide accurate comparative data (Table 6).

**Table 6: List of downtime**

Plant	Uptime total	Reason for downtime	Downtime in %
DISAMATIC	94%	Pattern change	1.4
		Machine trouble	1.8
		Waiting for iron (change of material)	1.2
		Alloy change	1.0
		Other reasons	0.6
Tight flask line	94%	Waiting for iron (change of material)	2.7
		Machine trouble	2.5
		Remove remain metal from auto pour	0.3
		Pattern cleaning	0.1
		Pallet car change	0.1
		Other reasons	0.3



Picture 7: Cores in flask

Due to the excellent management of the foundry, the production and maintenance departments guarantee a very high uptime on both plants. They employ a preventive maintenance strategy and educate their staff continuously promising further increases in uptime in the future.

Cast iron is used in both processes for patterns and pattern plates. Their expected service life in each process is 400,000 cycles before they are scrapped. The costs of these tools for comparable patterns vary considerably in the South Korean market. This means that the costs of core boxes producing the cores for the DISAMATIC moulding process amount to only 70% of those for comparable core boxes for the tight flask line. Prices of pattern and pattern plates for the vertical process are also more favourable, amounting to only 74% of those used on the tight flask line.

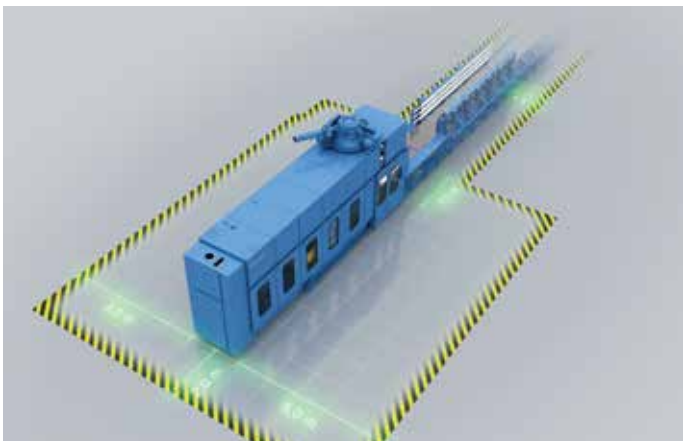


Picture 8: Pattern plate for tight flask line

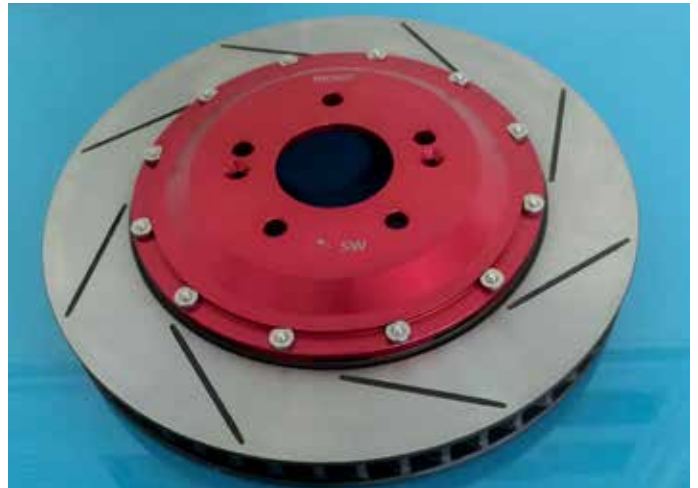
We lack detailed data in the area of mismatch and dimensional accuracy of the castings. There seem not to be significant differences between the two processes. 5mm are added to the diameter at all castings for machining, which is performed 100% in house enabling direct feedback in the event of quality issues.

The streamlined gating system developed by DISA enabled a significant optimization of the foundry in terms of yield. The total weight of a poured cluster of two discs using a conventional gating technology was 35.9 kg. The pouring cup and gating accounted for 12.9 kg, resulting in a yield of 64.7%. The introduction of new technology reduced the share of the pouring cup and the gating to 8.2 kg. The total weight of the poured cluster thus fell to 31.4 kg, increasing yield to 73.9%. The yield of the flask moulding plant is 73%.

A comparison of the power consumption by the two moulding machines is not possible in this foundry. There is however no doubt that the vertical moulding process has considerable advantages. It is, however, possible to compare the energy consumption of each production line including filter plants, vibration runners, sand supply units, belts and cooling drums. The energy consumption per hour of the tight flask production line is 625 kWh, while the DISAMATIC production line uses only 232 kWh. Neither figure includes power consumption by the heated pouring devices. Both systems have their own green sand preparation plant (120 t/h each) from different manufacturers. This is necessary because of the distances between the production lines and different demands on the greensand. In 2013, the power consumption of the vertical parted line sand plant averaged 530 kW/h, while the consumption of the horizontal parted line was 540 kW/h.



Picture 2: Production-line



Picture 9: Machined brake discs of the foundry Hyundai Sungwoo

### Summary

The article compares different aspects of brake disc production using vertically parted flaskless moulding lines and horizontal parted tight flask moulding lines. In the first section the vertical moulding process demonstrates advantages in terms of investment costs. The discussion addresses annual production density in tons per square meter of the foundry area in use. Area use is a significant factor in relation to production. Furthermore, annual energy consumption of the moulding lines in relation to castings produced is discussed, again demonstrating clear benefits from the DISAMATIC-technology. Developments in vertical mould process are tested for their effects on the application of technology. The possible increase in the yield or production volume suggests further potential for cost optimization in the foundry.

In the second section a comparison between two moulding technologies for the production of brake discs (Figure 9 and 10) is made on the basis of production data from the South Korean foundry Hyundai Sungwoo. The two plants have been in operation for several years, enabling us to learn from maintenance experience. Equipment performance as well as respective scrap and uptime were compared. In this case, no significant differences in performance, yield and quality between the technologies are found. The DISAMATIC moulding process, however, offers advantages in terms of tooling costs and energy consumption.

**DISA**  
shaping industry

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Magma Engineering / Toto Engineering:

## Taking an unusual approach

Surya TOTO Indonesia is the first overseas factory of TOTO Japan and was opened back in 1977. TOTO itself was founded in 1917 as a manufacturer of ceramic sanitary wares and plumbing hardware and grew to become Japan's industrial leader in sanitary and plumbing related products. Now in the 21st century TOTO is also a company that is devoted to enhance our lifestyle while preserving our environment with the help of eco/friendly products. Among many other accolades Surya TOTO was recently awarded as one of the 50 best Indonesian companies by Forbes Indonesia.

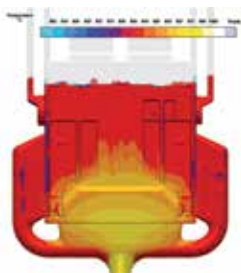
The Surya TOTO engineering division was challenged to produce something they never made before. A cast part for a thermostat which was unique and significantly different compared to anything which has been manufactured earlier, due to the fact that this new cast part had to be leak proof using pressurised water at 5 bars.



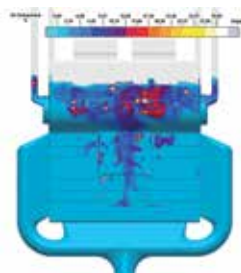
Thermostat

The first die designs delivered a relatively bad performance with high reject rates and surprisingly, even castings which looked promising after visual inspection did not pass the leak test. Analysis of the design in MAGMA5 showed that most of the problem was related to the filling process, a standard LPDC approach with the biggest ingate at the bottom. Temperature drop during the filling led to cold shut defect. Gas holes could be found on the casting surface which were caused by splashing and turbulence during filling.

The original design had 3 ingates for the metal flow, the main ingate in the bottom middle part and 2 side ingates to provide fresh melt into the thin wall area. Filling temperature result (see Pic 1) revealed that this theory did not work. During filling most of the melt was flowing through the main ingate and towards the end, the melt temperature in the thin wall area dropped significantly, which increased the risk for cold shut problem.

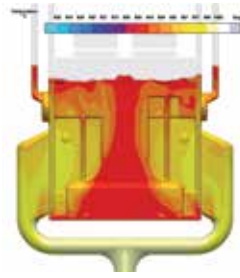


Original Design – Filling Temperature

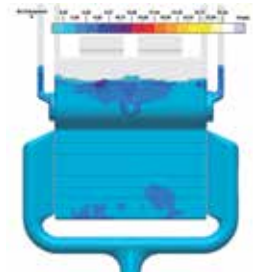


Original Design – Air Pressure

This design arrangement created another problem. The melt velocity from the middle ingate was relative high and generated splashing throughout the filling process. A new improved design was necessary and there were some request to make as little modification as possible. Analysis of the existing design gave the conclusion that the middle ingate as well as the filling pressure curve caused most of the problems. Instead of lowering the flow rate at the main ingate by reduction of the diameter or width, the TOTO engineering team decided to try and take out the ingate completely and used MAGMA5 to verify this idea and find the optimal filling pressure curve for this new design with reduced splashing and air entrapment.



Improved Design – Filling Temperature



Improved Design – Air Pressure

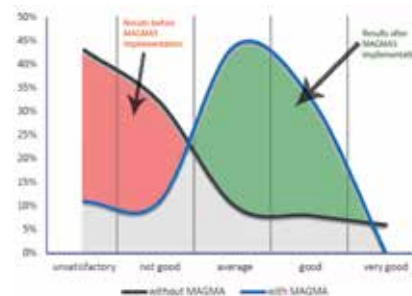
The improved design delivered a promising simulation result. Filling temperature profile for the thin wall area was improved significantly. The temperature in that particular area remained above the liquidus temperature and the risk for cold shut was eliminated. Splashing and turbulence was reduced considerably so there were no more rejects due to blow holes. The engineering team decided that this design was good enough for the actual shop floor try out and it delivered the promised result.

Every new die design in Surya TOTO is evaluated for their performance. There are 5 different quality criteria and the rating starts from unsatisfactory to very good. A new die is considered good to go if it has a quality criteria of good, which means the mold passed 80% of the required conditions for the daily manufacturing process. Prior to MAGMA5 implementation, 80% of all new dies were rated below average, costly modifications and improvements still had to be done



Actual cast part

to make them ready for daily production. After MAGMA5 was fully implemented this number was reduced from 80% down to only 20%, increasing the initial success rate significantly.



Rating of initial design



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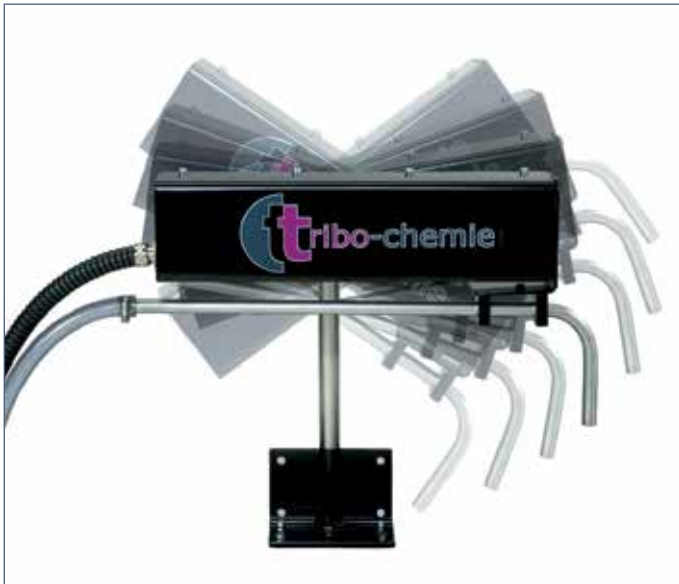
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# Global Casting Magazine

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WWW.GLOBALCASTINGMAGAZINE.COM

JUNE 2014 VOLUME 4 NUMBER 2



**China Foundry for BMW**  
**宝马公司在中国建铸造厂**

Published By:

 **Foundry-Planet.com**  
B2B Portal for technical and commercial foundry management

**MODERN CASTING**  
A PUBLICATION OF THE AMERICAN FOUNDRY SOCIETY

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Casting Competence Across Three Continents

General Kinematics:

## Case Study A to B = Impossible

### Challenge

A North American foundry customer had two existing parallel lines in their facility. The second line was to be modified and run a special alloy material. To compound this change, prior to having the sprue removed the alloys needed to be cooled before joining in with first line to be blasted.

### Approach

GK engineers went to work studying the options for this customer. Due to a lack of space, the GK SPIRA-COOL® was the first considered. Able to replace the otherwise 122 feet of space needed for a regular vibratory conveyor, the SPIRA-COOL® could do so in 18 feet. It also would gain a large amount of the elevation needed to bring the alloys back to the first line.

### Solution

General Kinematics engineered and manufactured the SPIRA-COOL®. This unit not only met the small space requirements but achieved a great amount of cooling of both the sprue and castings together. The materials then were able to be transferred to a de-spruing conveyor and back over to the existing first line.

### Results

The beauty of this concept was twofold. First it solved all of the issues the foundry had considered from trying to extend the building itself to trying to rearrange all of the equipment at the facility. Secondly, with the small footprint requirements for the SPIRA-COOL®, it could be installed with no modifications to the existing floor and completed without shutting down the existing lines in the plant. This foundry is impressed with this solution from the General Kinematics team.

About General Kinematics General Kinematics Corporation, incorporated in 1960, was established to market, design, and custom fabricate innovative vibratory materials handling and processing equipment. Today the company is one of the world's largest suppliers of vibratory processing equipment, holding more than 200 worldwide patents, and is acknowledged as a major contributor to the technical advancement of vibrating equipment design and application. Today, over 50,000 General Kinematics units have been installed in virtually all of the world's industrialized countries.



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**Senior Editor:** Oanh Nguyen (responsible according to the press law)  
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**Phone:** +49 (0) 8362/93085-65  
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**E-Mail:** [marketing@foundry-planet.com](mailto:marketing@foundry-planet.com)  
**Web:** [www.Foundry-Asean.com](http://www.Foundry-Asean.com)  
**Printed by:** Intirimbo Jakarta  
**Pictures:** Work pictures of the press announcements  
**Publishing company:** Foundry Planet Ltd.  
 CEO Thomas Fritsch  
 Sebastianstraße 4  
 D-87629 Füssen

**Tax number:** 125/104/35026  
**VAT-Nr.:** DE241247752  
**Trade register:** 05357464, Cardiff/GB

**Design & Artwork:** Kurt Braunisch, Berlin  
[www.braunisch-communication.de](http://www.braunisch-communication.de)

The foundry magazine for the SouthEastAsia market [www.Foundry-Asean.com](http://www.Foundry-Asean.com), was solely printed for the Indometal – International Metal & Steel Trade Fair for Southeast Asia” (organized by Wakeni and Messe Düsseldorf Asia) . The digital version can be found on [www.Foundry-Asean.com](http://www.Foundry-Asean.com)

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Dr. Fabrizio Carmagnini, Italy's General Secretary of AMAFOND.



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The German machinery and equipment suppliers who are exhibitors at the **INDOMETAL** provide high end technological solutions for the metallurgical industry. They see themselves as technology partners for the achievement of the goals that have been set. They offer innovative solutions to meet requirements for improved sustainability, efficiency, productivity and product quality. This year the German Federal Ministry of Economics and Technology (BMWi) are supporting for the first time a German group participation, giving more than 14 companies the platform to present their excellent products and to offer their renowned services to key players and decision makers from Indonesia and Southeast Asia. The German Engineering Federation VDMA with its metallur-

gy-related associations Foundry Machinery, Thermo Process Technology as well as Metallurgical Plants and Rolling mills are one of the initiators of the German participation, accompanying the German delegation and providing professional advice. On behalf of the German exhibitors, the German Engineering Federation (VDMA) wish all participants a successful show and extend a warm welcome to all visitors.



Winfried Resch, VDMA



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APLINDO:

## On Industry in Indonesia

**Within 3 years starting in 2009, there was tremendous export of minerals from Indonesia with an increase in nickel ore from 4 million ton to 33 million, iron ore from 4 million ton to 13 million, copper ore 7 million ton to 80 million and bauxite from 8 million ton to 40 million ton.**

Realizing this increase in export, the Indonesian government issued a downstream policy in 2012, in which minerals have to be first processed and purified through smelters to get a semi finished product domestically before exporting. Since January 12th, 2013 mineral export as a raw material has been banned and we are now in the process of building smelters which need energy from coal. It will take up to 1-2 years to develop the semi finished product which can then be exported. These semi finished products have to be processed again to produce metal such as pig iron or aluminum ingot to supply the foundry industry and other industries. Since the metal still isn't produced in the country, the metal for supplying the foundries are coming from import. APLINDO (Asosiasi Industri Pengecoran Logam Indonesia / Indonesian Foundry Industries Association) consists of ferrous and nonferrous foundry member companies. In ferrous casting, the raw material is steel scrap and pig iron, and in nonferrous casting, the raw material is aluminum scrap and aluminum ingot. Both casting member companies are producing automotive component and parts. Almost all automotive brand holders in Indonesia such as Honda, Daihatsu, Mitsubishi, Suzuki are expanding in investment. Toyota is planning to invest around US\$ 2.6 billion for the next seven years starting in 2013. This equals the company's total investment in Indonesia over the past 40 years. Needless to say, this investment would not have been possible without the support of the government. With

reference to data from the Association of Car and Motorcycle Equipment, the number of component companies in Thailand stand at over 2,300, where as in Indonesia, it is currently just above 600. However, the industry has a positive momentum and we aim to catch up with Thailand. Capitalizing on the growth of the automotive sector should help drive up demand for Indonesia auto parts and components. In order to continue to expand our production locally and be price-competitive, we need to localized. The country lost traction long ago when we focused on the national car project and became less attractive than Thailand, but in recent years the government has pushed ahead with a stronger component industry including the foundry industry.



Mr. Achmad Safiun  
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Foundry Technologies & Engineering GmbH (FT&E) Phone: +41 52 620 10 56

**Sales & Marketing:**

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ASEAN Countries:

## The Rise of Glocal Education

Recent years have seen growing interest in a new type of international student: the 'glocal' student. Glocal students have been defined by Dr. Rahul Choudaha, director of Research & Advisory Services at World Education Services, as students who have global aspirations, but prefer to stay in their home country or region for education – and the fast-developing 'ASEAN' countries are leading this trend.

The Boston Consulting Group and McKinsey & Company have predicted that by 2020 there will be 100 million people with middle class spending patterns across the Association of South East Asian Nations (ASEAN) – such as Indonesia, Malaysia, the Philippines, Singapore and Thailand. Will glocal students from this emerging regional demographic represent the future of transnational education (TNE)?

### The new international students?



The motto of the United Nations is, "Think globally, act locally". In a globalized economy, every student should be educated as an international student, a global citizen with the aspiration to compete globally. However, not everyone is lucky enough to be blessed with the talent and wealth to be admitted to the world's most competitive and expensive universities. Transnational education, defined as education for students based in a different country to the degree-awarding institution, is becoming increasingly popular. It often offers students an international experience with the advantages of better affordability, lower English language requirements, less competitive admission standards, and regional economic initiatives.



### The rise of ASEAN countries

In the aftermath of the global financial crisis, Asia has increasingly attracted the attention of the world with its booming economy and the abundance of business opportunities in countries such as China, India and now ASEAN. The ASEAN countries are home to 600 million people, with a combined nominal GDP of US\$ 2.1 trillion in 2012, predicted to grow at an annual rate of 5.5% in 2013. What

is also striking is their economic ambition: by 2015, ASEAN aims to integrate the whole Southeast Asia region into the 'ASEAN Economic Community (AEC)', with free movement of goods, services, investment, labor, and capitals. Just look at how the European Union operates now, and you can imagine what a massive change this would bring in two years' time to everyone who is lucky enough to be connected with ASEAN, or Asia in general. This applies both to students and universities.

### Developing southeast Asian universities



Higher education will play a crucial role in supporting the continued economic integration of ASEAN by 2015. An ambitious plan was set up in 2009, aimed at creating a systematic mechanism to support the integration of universities across Southeast Asia. Student mobility, credit transfers, quality assurance and research clusters were identified as the four main priorities to harmonize the ASEAN higher education system, encompassing 6,500 higher education institutions and 12 million students in 10 nations. The ultimate goal of the scheme is to set up a Common Space of Higher Education in Southeast Asia. Individual ASEAN governments have increased public investment in universities to support the ASEAN Higher Education Area, and the region's burgeoning knowledge economy. Measures have been set up to strengthen the performance of Southeast Asian universities across a wide range of indicators such as teaching, learning, research, enterprise and innovation. These initiatives also pave the way for further collaboration and integration between universities in the region, enhancing the overall reputation of Asian universities compared to their competitors in the West and elsewhere in the world. It is not surprising to see the improved performance of many ASEAN universities in this year's QS University Rankings: Asia.

"Asian higher education is undergoing a rapid transformation, and Singapore, Hong Kong, China and Korea are at the forefront of the assault on the global academic elite," says Ben Sowter, head of QS Intelligence Unit, which compiles the QS University Rankings: Asia and the QS World University Rankings. "There are already 17% more Asian universities in the global top 200 since the recession, and the next two decades could see leading US and European universities objectively overtaken." At the moment Singapore is the only ASEAN country whose universities are operating at the forefront of Asian higher education. But if Asia continues on its current path and emerges as a genuine competitor to the West in the coming years, the increased financial power of a unified ASEAN could start to have a major impact on global higher education. And glocal students in the region would be among the foremost beneficiaries.



*This Article was written by  
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Deutsche Messe AG – Metal + Metallurgy China 2015 (31 March to 3 April) in Shanghai:

## Trade fair a key springboard for exporters selling into China's heavy industries

China is by far the world's biggest steel producer. No other country even comes close. Its steel output dwarfs that of the EU, which ranks a distant second. Much of China's steel output feeds the country's own insatiable demand, the bulk of which comes from the construction industry, mechanical engineering and automotive manufacturing. China is also an extremely dominant player in the foundry industry, not to mention a major consumer of aluminum and copper and a major producer of important non-ferrous metals and rare earths.

These vital economic statistics are well catered for in the exhibition program of Metal + Metallurgy China, one of the world's foremost trade fairs for foundry technology, industrial furnaces and smelter and rolling mill plant and equipment. Metal + Metallurgy China is organized by CFA (China Foundry Association) and Hannover Milano Fairs Shanghai, the Chinese subsidiary of Deutsche Messe AG, Hannover.

The next Metal + Metallurgy China runs from 31 March to 3 April 2015 and will thus be one of the first events to be held at the new exhibition center in Shanghai's Hongqiao district. Shanghai is a prime location right on the doorstep of the world's biggest market for hot metal processing plant and equipment.

Shanghai is now second only to Beijing as China's most important region for heavy industries and is an economic powerhouse of the country's metallurgy industry. Home to around 24 million people, it is China's wealthiest and most populous city. Together with the surrounding Greater Shanghai Area (GSA), it is a market of immense importance for German exporters. Some 47 percent of all German-owned business operations in China are based in Shanghai.

Metal + Metallurgy China 2014 featured 1,335 exhibitors and occupied around 81,000 square meters (871,900 sq. ft.) of display area. In keeping with its position in such an important and highly developed market, it attracted more than 81,000 trade visitors from diverse backgrounds, including the automotive and aircraft industries,

the IT sector, the electrical engineering industry and the railroad construction and shipbuilding industries. China is here to stay as one world's leading industrial nations. It is a growth market that offers rich opportunities for enterprising international companies in the metals and metallurgy industries. And one of the best ways to access those opportunities is to participate at Metal + Metallurgy China.

### Deutsche Messe AG

With revenue of 312 million euros (2013), Deutsche Messe AG ranks among the world's ten largest trade fair companies and operates the world's largest exhibition center. In 2013, Deutsche Messe planned and staged 119 trade fairs and congresses around the world – events which hosted a total of 41,000 exhibitors and some four million visitors. The company's event portfolio includes such world-leading trade fairs as CeBIT (IT and telecommunications), HANNOVER MESSE (industrial technology), CeMAT (intralogistics), DOMOTEX (floor coverings), and LIGNA (wood processing and forestry). With over 1,000 employees and a network of 66 representatives, subsidiaries and branch offices, Deutsche Messe is present in more than 100 countries worldwide.



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Messe Düsseldorf international at indometal 2014:

## See the BEST global expertise and technologies for the metal and steel industries

As a specialist trade fair focused on the synergistic interrelations of foundry technology, casting products, metallurgy and thermoprocess technology, indometal 2014 presents international and Indonesia's leading producers, equipment manufacturers, product distributors with their latest high-level technology, machinery, innovations and products for Indonesia and the region's thriving metal and steel sectors.

Jointly organized by Messe Düsseldorf Asia and PT Wahana Kemalaniga Makmur (WAKENI), indometal 2014 will be held from 11 to 13 December 2014 at the Jakarta International Expo Kemayoran, Indonesia. Targeting over 10,000 quality trade visitors from around the globe, indometal 2014 connects high-calibre industry professionals with some 300 global industry players from 30 countries including Indonesia's leading metal and steel companies with strong manufacturing capabilities across the steel, aluminium, copper, cobalt, nickel and other metal sectors.

**Trade visitors will experience a dynamic world of metals with cutting-edge technologies, innovations, products and solutions and:**

- Meet with top metal and steel technology and processing experts from national pavilions and groups from Austria, China, Germany, Indonesia, Italy and Taiwan
- Increase their business productivity and manufacturing efficiency with the latest and most sophisticated machinery and equipment
- Improve their business supply chain with cost-effective processing technology
- Establish strategic partnerships and network with leading industry experts through various concurrent conference and seminars

**indometal 2014 - The ideal platform to serve Indonesia's robust industry needs**

Latest industry statistics from Indonesia's Ministry of Industry indicate a US\$400 million investment for infrastructure projects that include construction of roads, seaports, airports, railroads and power plants to support its economic developments. Expansion of manufacturing, processing and other production activities at key economic corridors with metal-industry developments (such as Banten, South and West Kalimantan, North Sumatera, Sulawesi, North Maluku, Papua and etc.) will benefit global and domestic industry players across the steel, aluminium, nickel and copper industries. With the ASEAN Economic Community (AEC) taking

place in 2015, steel demand in the region is expected to be further boosted with the implementation of large-scale infrastructure projects to enhance ASEAN connectivity. As the country with the largest economy and highest population in ASEAN, Indonesia's share of steel consumption reached 20.9% making it the top second steel consuming country in the region. With its own dynamic market and industry potential, Indonesia is also well-positioned for leading companies to anchor their business here.

Against this dynamic backdrop and abundant economic opportunities, indometal 2014 is the ideal gateway for competitive businesses to venture ahead and expand their business further into Indonesia's growing metal and steel industries.

### indotools

A special feature at the trade fair is indotools - a dedicated showcase focused on high-technology tooling solutions, precision tooling, and cost-effective tooling systems that will synergistically complement indometal 2014. Be captivated with innovative solutions to tooling challenges that addresses the most sophisticated equipment, metallurgical and thermo process technology and machinery needs for the metal and steel sector. indotools offer a one-stop business and sourcing opportunity for the latest end-to-end solutions across the metal and steel industrial value chain. Join us to Transform Your Business! Pre-register your visit now at [www.indometal.net](http://www.indometal.net)



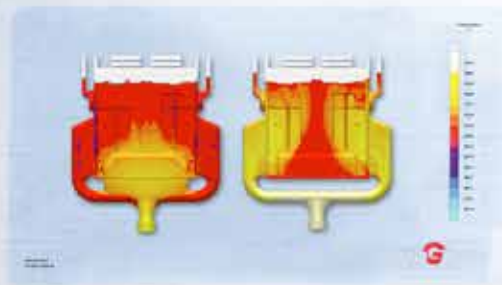
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