



# Global Casting Magazine

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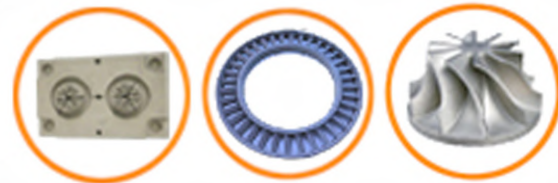
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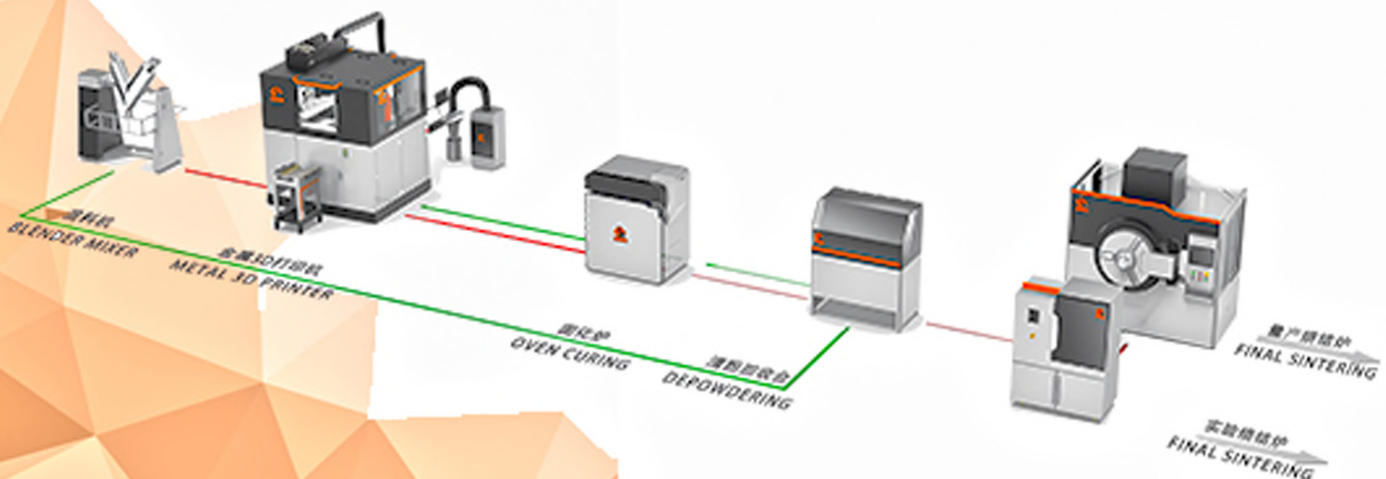
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**2023第四届压铸CEO峰会暨有色铸造轻量化高层论坛**  
4<sup>th</sup> Diecasting CEO Summit & High-level Forum for Lightweight Nonferrous Casting

# 科技赋能新时代

会议时间：2023年11月23-26日

会议地点：中国·珠海

Date: Nov.23~26, 2023

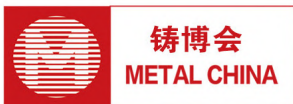
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# 2024

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The 22<sup>nd</sup> China International Foundry Expo ( Metal China )

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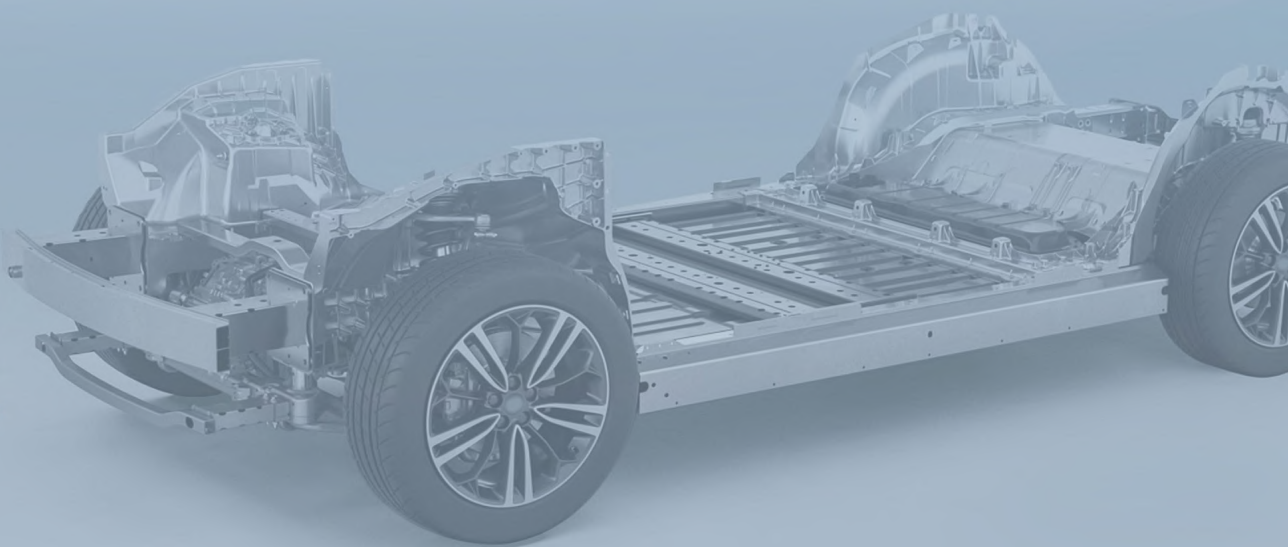
The 17<sup>th</sup> China International Die Casting Industry Exhibition

## 第十七届国际有色及特种铸造展览会

The 17<sup>th</sup> International Nonferrous and Special Casting Exhibition



中国铸造协会展会微信平台





# Global Casting Magazine

## 世界铸造

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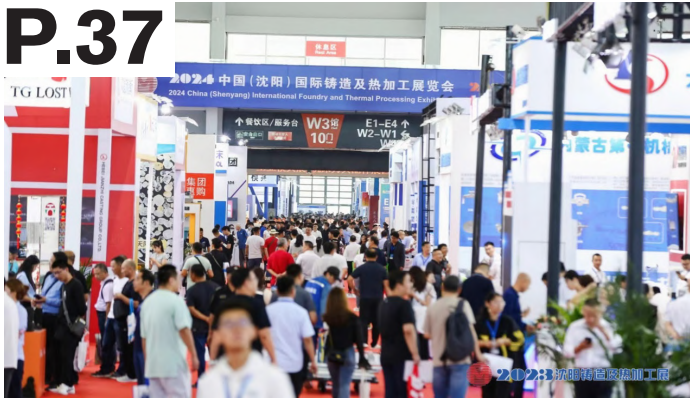
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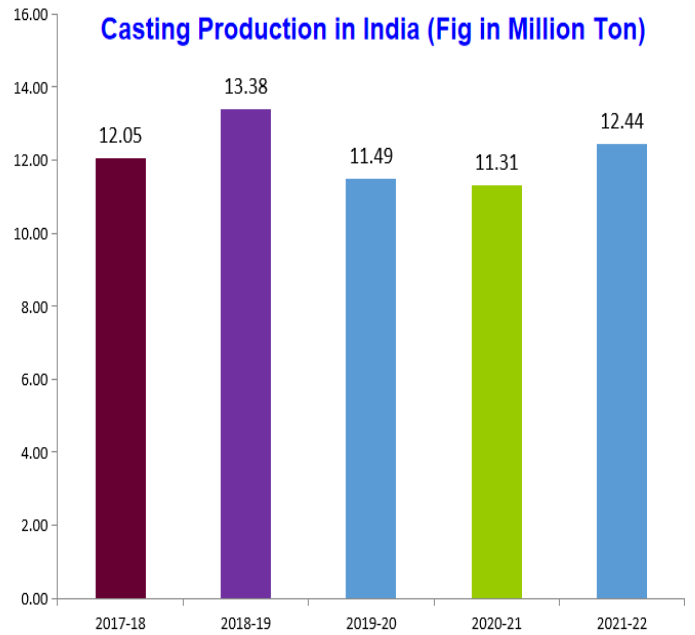
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## 12000T Goes Mass Production!

### 12000T 正式量产!

On June 30, Guangdong Hongtu Automotive Parts Co., Ltd. (Guangzhou Hongtu), a wholly-owned subsidiary of Guangdong Hongtu Technology Co., Ltd., held its opening ceremony in Guangzhou, which means Hongtu will begin the construction of a mega diecasting "lighthouse". The newly launched Guangzhou Hongtu also announced that the 12000T intelligent mega diecasting unit was officially put into production.

Guangzhou Hongtu plans to invest in 6 sets of 7000T-16000T diecasting units, build CNC precision machining automation lines and automatic inspection and testing equipment, introduce the industry-leading diecasting technologies with independent intellectual property rights, including new materials, new technologies, new processes and new equipment, and produce mega structural components, such as front cabin, battery tray, rear floor, doors, skylights with high-strength and toughness.

At the ceremony, Hongtu Technology and LK Group signed a cooperation agreement to jointly develop 16000T die-casting unit, further leading the rapid development and technological progress of the large-scale mega die-casting industry. ■

6月30日，广东鸿图科技股份有限公司全资子公司——广东鸿图汽车零部件有限公司投产仪式正式在广州举行。广州鸿图的投产，是鸿图科技打造一体化压铸“灯塔工厂”建设的开启。投产仪式上，广州鸿图向世界宣告了12000T超大型智能压铸单元正式投产。

广州鸿图规划6台套7000T-16000T超大型智能压铸单元、建设精密数控加工自动化生产线和自动检验检测设备，导入具有自主知识产权的新材料、新技术、新工艺、新装备等行业领先的一体化压铸技术，生产高强度超大型一体化前舱、电池托盘、后地板、车门、天窗等结构件。

在仪式上，鸿图科技与力劲科技签署了联合开发16000T超大型智能压铸单元的合作协议，进一步引领大型一体化压铸产业的快速发展和技术进步。 ■

## Wencan Launched its New Intelligent Plant in Foshan

### 文灿集团佛山新能源汽车轻量化智能工厂启动



On May 19, 2023, the groundbreaking of Wencan Group's New Energy Automobile Intelligent Factory was held in Foshan.

Chairman of Wencan Group Mr. Tang Jiexiong said, "based on the existing factory in Foshan, we will build a green intelligent manufacturing factory for new energy vehicle components with

2023年5月19日，文灿集团佛山新能源汽车轻量化智能工厂动工仪式在南海区里水镇文灿新基地隆重举行。

文灿集团董事长唐杰雄表示，此次在佛山原有工厂的基础上，以领先于行业的最高标准，建设绿色低碳的新能源汽车零部件轻量化智能制造工厂，将会引进全球顶尖的生产设备和管理系统，打造世界一流水平的智能化制造工厂。

文灿集团董事兼副总经理高军民做了详细介绍：工厂占地面积124亩，建筑面积6.8万平方米，总投资8亿元，预计达产后营业收入达到10亿元；规划配置2200T-12000T压铸机30台，大型龙门五轴加工中心等高端设备120台套；主要从事铝合金高压压铸，

the highest industry standards. We will introduce world-class production equipment and management systems, and build a world-class intelligent manufacturing factory.”

According to Mr. Gao Junmin, the director and deputy general manager of Wencan, the new plant covers an area of 124 acres, with a building area of 68,000 square meters, and the total investment is RMB800 million yuan, and it is expected to achieve a revenue of 1 billion yuan after the production capacity is reached. The plant will install 30 sets of 2200T-12000T die-casting machines and 120 sets of high-end equipment such as large-scale 5-axis machining centers; It is mainly engaged in the production of aluminum alloy high-pressure die castings, such as new energy automobile electric drive system, electric control system, battery system, chassis system and body castings. Its annual design capacity is 40,000t. It is expected to start production in May 2024. ■



产品包括新能源汽车电驱系统、电控系统、电池系统、底盘系统、车身铸件，年设计产能4万吨铸件，预计2024年5月正式投产。■

## Greater Core Advantage with Mingzhi's Foundry Experience

### 明志科技提升核“芯”能力

The roots of Suzhou Mingzhi Technology Co. Ltd (Mingzhi Technology) extend back to 2003. The company has grown from domestic leader to a respected international forerunner in the core and casting industries. Both in developing its products and serving customers, Mingzhi Technology applies its expertise to increase customer value through high efficiency, quality, stability and precision. With an eye on innovation, Mingzhi seeks to develop green and intelligent manufacturing solutions and environmental-friendly processes which benefit both the customer and to the greater society we live and work in.

#### Mingzhi Expands New Core Services

May 8-11, 2023, Mingzhi Technology participated in the 21st China International Foundry Expo (METAL CHINA) where they showcased a variety of complex sand cores and core packages, attracting numerous domestic and international visitors. Mingzhi further introduced the production characteristics and advantages of the "precision core package process", and featured our motto "Casting made simple: We Mold, You Pour". In addition, Mingzhi's new business activity was presented: in-house production of sand cores and core packages utilizing the precision core package process.

Mingzhi received heightened praise from visitors and won the "Most Attractive Exhibitor" award at the exhibition. Its "intelligent and integrated core centre" and "commercial vehicle hydrogen fuel cell floor" also won the "National Foundry Equipment Innovation Award" and "Gold Award for

苏州明志科技股份有限公司于2003年创建，专注于铸造领域，以高端铸造装备和高品质铝合金铸件生产为两大业务，为客户提供高效智能制芯装备、铸件产品的研发与制造，致力于引领和推动我国铸造行业技术更新与产业升级，为铸造产业绿色智能发展赋能。

#### 明志科技开拓砂芯服务新业务

2023年5月8-11日，明志科技参加了第二十一届中国国际铸造博览会并展示了各种高难度的砂芯和芯组，吸引了众多国内外参观者驻足观看。通过讲解和交流“精密组芯造型技术”的生产特点和优势，传递了“我造型、你浇注”的新铸造生产模式，以及明志科技的新业务——制芯服务、精密组芯造型服务和砂再生服务。

明志科技得到了大量参观者的点赞，由此获得了“最具吸引力展商”奖；其“智能制芯集成平台生产线”和“商用车氢燃料电池底板”也分别获得了“全国铸造装备创新奖”及“优质铸件金奖”，再一次证明了明志科技在行业内的知名度和影响力。

#### 明志科技制芯设备在 GIFA 大放异彩

6月12日-6月16日，明志科技再次亮相德国GIFA国际铸造展，展示了在制芯设备和技术方面取得的创新进展——中国制造的全新MDs系列制芯机、德





High Quality Castings" respectively — further demonstrating the recognition and influence of Mingzhi Technology in the foundry industry.

### Mingzhi's Core Making Equipment Shines at GIFA

June 12-16, Mingzhi Technology once again exhibited at the GIFA fair in Germany. Mingzhi showcased the innovative progress made in core making equipment and technology, including the new MDs series core making machines, made in China, the MP series core making machines, made in Germany, the MiCL intelligent core making control system, the precision core package technology (PCP), and our inorganic core making equipment technology. Visitors witnessed our MP40 core machine in dry cycle production, and took home souvenir sand "Panda" cores produced by our MDs100 machine at the show.

Mingzhi has always been committed to the innovation and R&D of core making technology to improve foundry core production, as well as drive upward transformation within the foundry industry.

For more information, please visit: <http://www.mingzhi-tech.com/> or <https://www.mingzhi-tech.eu/> ■

国制造的 MP 系列制芯机，MiCL 智能制芯控制系统，精密组芯造型技术（PCP）以及明志无机制芯装备技术等。MDs100 每天上午进行熊猫砂芯的无机制芯演示，MP40 全天候空循环展示，吸引了众多参观者。

明志科技始终致力于制芯技术的创新研发，助力铸造企业的制芯生产，推动铸造业的转型升级，将以无限热忱与全球铸造同仁携手并进，铸造未来。

更多信息，请访问公司网站: <http://www.mingzhi-tech.com/> 或 <https://www.mingzhi-tech.eu/> ■

## Calderys China and S&B Bentonite Bring One Stop Shop Solution for Foundry Industry at METAL CHINA 2023

# METAL CHINA 2023: 凯得力 / 艾斯比永同昌为铸造行业带来一站式解决方案

Calderys China Co., Ltd. and S&B Bentonite (Chaoyang) Co., Ltd. jointly presented our One Stop Shop Solution for Foundry Industry at METAL CHINA 2023. The trade show, which is one of the most influential ones in foundry industry in the world from May 8th to 11th in Tianjin.

Calderys Technology Day was successfully held during METAL CHINA 2023.

Calderys Technology was kicked off by the official announcement of Calderys and HWI Joining Force that was made by Ish Garg, Calderys Senior Vice President, APAC and Fiona YANG, Calderys China Vice President.

Calderys SEA Market Foundry & Aluminum Account Manager, Guanbai Chang, shared with our customers on the topic: How to select lining material for the Coreless Induction Furnace used for casting iron & A case study on improving the lining life and Sandra Böhnke from Imerys Metalcasting Germany GmbH spoke on the topic of "Bentonite, coals, emissions, and CO2 calculations."

During the Q&A session, our speakers answered questions raised by our customers, for example, a customer from Tianjin asked about what the difference is between our QUICK TS and Pre MIX, for bentonite products, Sandra explained that, "for QUICK TS, we add process carbon to improve the fluidity of the molding sand thus to improve the surface finish of the castings; while as for Pre MIX, a mixture of bentonite and coal in certain proportion is used to improve the on-site operating environment, which is more environmentally friendly and safer." As for refractories, Guanbai gave a more detailed explanation of our fine crystalline quartzite from mines in Sweden and applications based on customers' onsite construction conditions.

### About Calderys

Calderys is a leading global provider for industries operating in high temperature conditions. The Group specializes in thermal protection for industrial equipment, with a wide range of refractory products and advanced solutions to enhance steel casting, metallurgical fluxes and molding processes. Our international network of experts ensures an end-to-end offer with tailored services. Drawing on over 100 years of experience, we support

2023年5月8-11日，凯得力中国区亮相在天津举办的第二十一届中国国际铸造博览会。凯得力耐火材料(中国)有限公司与艾斯比永同昌(朝阳)膨润土矿业有限公司联袂为铸造行业带来了我们的一站式解决方案。

展会期间，凯得力耐火材料与艾斯比永同昌(朝阳)膨润土携手举行了凯得力技术日。

凯得力技术日以凯得力亚太区高级副总裁 Ish GARG 先生和凯得力中国区副总裁杨凤女士正式公布凯得力与哈宾逊沃尔克国际战略合并正式拉开帷幕。

凯得力亚太区铸造·铝行业大客户经理神城冠白先生为我们的客户带来了“铸铁用无芯感应炉的炉衬耐火材料选择以及提高炉衬耐火材使用寿命的案例”。益瑞石金属铸件德国有限公司铸造研发工程师 Sandra Böhnke 女士带来了“膨润土、煤、碳排放与二氧化碳计算”为主题的技术分享。

在问答互动环节，我们的技术专家与与会者进行了更深层次的交流和分享，回答了很多客户提问。来自天津的一位客户询问艾斯比永同昌(朝阳)膨润土矿业有限公司生产产品中 QUICK TS 与 PreMIX 的区别。Sandra 回答 QUICK TS 为膨润土中添加了加工碳，用来提高型砂流动性，改善铸件表面光洁度；而 PreMIX 是膨润土和煤粉按一定比例混合，用来改善现场作业环境，更环保更安全。在耐火材料方面，我们的技术专家冠白更详细地向提问客户介绍了凯得力瑞典微细结晶石英岩的特色以及配合客户工况的应用。

### 关于凯得力

凯得力是全球领先的高温行业解决方案提供商。我们的核心业务包括耐火材料、以及铸钢连铸保护渣、型砂粘结剂等产品 and 解决方案，覆盖高温解决方案业务领域的全部范围。我们用 100 多年的经验来支持客户的能源转型需求。凯得力在 30 多个国家和地区拥有 5,000 多名员工，



our customers in their energy transition needs. Calderys reported revenues of €981 million in 2022 and counts more than 5,000 people, including 2,000 contractors, in over 30 countries. For more information, please visit [www.calderys.com](http://www.calderys.com) ■

国际网络遍布北美、欧洲和亚洲；专业的知识和创新的理念确保提供长期稳定的优质产品组合、可信赖的性能；以及定制化的解决方案。如需更多信息，请访问 [www.calderys.com](http://www.calderys.com) ■

## KBR Foundry Provides One-stop Service for Investment Casting

### 科博尔为精密铸造提供一站式服务

Established in 2003, KBR Foundry, a subsidiary of Suzhou KBR Machine Tool Group Co., Ltd. is a professional manufacturer and one-stop solution provider of gray iron and ductile iron castings for the mechanical industries such as machine tool, lathe bed, chassis, and air compressor pump. It focuses on batch and large castings production. The company has received the certification of ISO9001:2008.

KBR started the construction of its production base in Ningguo, Anhui in March 2019, and the new plant has been put into production in 2021, with a total construction area of nearly

苏州科博尔铸造成立于2003年，隶属于苏州科博尔机床集团有限公司，为机床、床身、机壳、空压泵等机械行业提供铸件生产及加工的一站式服务，专注于批量和大型铸件的生产，公司已通过质量管理体系 ISO9001:2008 认证。

科博尔铸造于2019年3月在安徽宁国投资建厂，总建筑面积约为91000平方米，工厂已于2021年投产。公司采用先进的呋喃树脂砂铸造工艺，专业生产灰铁（HT）材质、



91,000m<sup>2</sup>. Through the advanced furan resin and coated sand casting technologies, the new plant is specialized in producing gray iron (HT) and ductile iron (QT) castings, with an annual output of over 40000 tons.

The company is well-equipped with advanced investment casting production equipment, physical & chemical analysis and testing equipment, which can meet the requirements of different customers. The products are widely used in fields such as machine tools, air compressors, and construction machinery. By now, KBR castings have been exported to countries such as Japan, the United States, Germany, and Canada. KBR Foundry has become a major supplier to multiple international enterprises. ■

球铁 (QT) 材质等产品, 年产量达 40000 多吨。

公司拥有十分完善的熔模铸造生产设备, 先进的理化分析、检测设备, 能满足不同客户的要求。公司产品广泛应用于机床、空压机、工程机械等领域, 目前, 公司产品已出口至日本、美国、德国、加拿大等国家, 科博尔铸造已成为多家国际企业的主要供应商。

更多信息, 请访问公司网站: <https://kbrcn.com/> ■

## Yingliu and KOCEL Cooperated on Intelligent Project for Steel Castings Based on 3D Printing

### 应流集团与共享集团签约基于 3D 打印的铸钢件智能工厂项目

Recently, Yingliu Group and KOCEL Group have officially reached a cooperation to jointly build the world's largest intelligent steel casting factory based on 3D printing. The project is supported by the National Intelligent Casting Industry Innovation Center, a subsidiary of KOCEL Group, with a turnkey project including planning and design, general contracting, development and implementation of information systems, and integration of software and hardware; The KOCEL Intelligent Equipment Co., Ltd. provides the key equipment, including 3D printers and supporting equipment.

The intelligent factory is equipped with more than 10 large-

近日, 应流集团与共享集团正式达成合作, 携手共同打造全球最大规模基于 3D 打印的铸钢件智能工厂项目。该项目由共享集团下属子公司国家智能铸造产业创新中心提供规划设计、相关设备总包、信息化系统开发实施、软硬件集成等一揽子交钥匙工程; 由共享智能装备有限公司提供包括 3D 打印机及其配套设备在内的核心关键设备。

智能工厂配备了 10 台以上大尺寸、高效率砂型 3D 打

sized and high-efficiency sand 3D printers, achieving automatic AGV transfer, robot sand cleaning and core assembly, three-dimensional warehouse storage, automatic pouring, etc. The digitallized casting production is achieved through the whole casting process control platform.

The project is planned to be completed and put into operation in June 2024, and it will reach an annual production of 6000 tons of high-end steel castings after production. It has reached 100% in aspects of localization rate of main equipment and software, the numerical control rate of key equipment, and the automatic level of collecting key data in this project. The production mode of no sand box, no pattern, no heavy physical labor, no waste sand and dust emissions, and no temperature difference (it's operated under air conditioning environment) will lead the upgrade of casting production to green, high-end, and intelligent.

### About Yingliu Group

Yingliu Group has been deeply engaged in high-end manufacturing and focused on technological innovation for over 30 years, and has now formed an industrial pattern of coordinated development of high-end components, aviation technology, and nuclear materials. The products are exported to more than 100 leading customers in aviation engines, gas turbines, oil & gas and other industries in more than 30 countries, mainly in Europe and America.

### About KOCEL Group

Founded in 1966, KOCEL Group is a globally competitive industry leader, mainly engaging in the research and development, production, and sales of key components for high-end equipment. It provides 3D printers and supporting equipment, and intelligent manufacturing solutions for the casting industry, with more than 200 customers covering various fields such as aerospace, military, automotive, new energy, engineering machinery, compressors, robots, etc. ■

印机，实现 AGV 自动转运、机器人自动清砂和组芯、立体库存存储、自动浇注等，并通过铸造全流程运营管控平台，实现铸造生产运营数字化管理。

该智能工厂项目计划于 2024 年 6 月建成投产，投产后将实现年产高端铸钢件 6000 吨。该项目主要设备和软件国产化率、关键设备数控化率、关键数据自动采集率均达到“100%”，无砂箱、无模型、无重体力劳动、无废砂及粉尘排放、无温差（空调环境作业）的“五无”生产模式，将有力地引领铸造产业向绿色化、高端化、智能化升级。

### 应流集团

应流集团三十多年来深耕高端制造、专注技术创新，现已形成高端部件、航空科技、核能材料协同发展的产业格局。高端装备关键零部件制造技术水平、装备能力、产业规模行业领先，产品出口欧美为主的 30 多个国家的百余家航空发动机、燃气轮机、油气开采等行业龙头客户。

### 共享集团

共享集团始建于 1966 年，是一家具备全球竞争力的行业排头兵企业。主要从事高端装备关键零部件研发、生产及销售；提供铸造、金属等 3D 打印机及配套装备，为铸造行业提供智能制造服务，拥有客户 200 余家，涉及航空航天、军工、汽车、新能源、工程机械、压缩机、机器人等众多领域。■

## Qadri Group Invests in New OMEGA SINTO Foundry Machinery

### 卡德里集团购入 OMEGA SINTO 铸造设备

Foreseeing a rapid increase in the Cement & Mining Sector portfolio and markets, Qadri Group from Pakistan decided to invest in another Automatic Carousel (Molding line) & Continuous Sand Mixer some time back. Based on their previous experience, the choice once again was OMEGA SINTO FOUNDRY MACHINERY LIMITED, UK.

With the addition of this new Carousel and continuous sand mixer of 20 TPH, the Molding capacity will double. The Pouring capacity of this foundry facility will increase by 60% and the combined annual pouring capacity of all foundries will reach 20,000 tons!

由于预期水泥和采矿行业的市场需求将快速增长，巴基斯坦的卡德里集团决定采购一条新的自动翻转起模机（造型线）和连续混砂机。基于他们之前的经验，再次选择了 OMEGA SINTO 铸造公司。

随着新的翻转起模机和 20TPH 连续混砂机的安装，造型能力将翻一番，该铸造厂的浇注能力将提高 60%，集团所有铸造厂的年产能将达到 20000 吨。

这条 6 个工作站式造型线使该铸造厂能够一次浇注多个不

This 6-station molding line enables the company to handle a variety of different patterns at a time. The automatic Rollover for mold stripping feature maintains mold accuracy, enables prevention of mold breakage, and ensures the ability to control mold size variation across different molds. Through the auto blend function of the pneumatic sand gate of the continuous sand mixer, they are able to reduce their sand wastage to a huge extent, and with an automatic compaction table human hand in the ramming process is removed, ensuring homogeneous sand compaction.

All these features of the automatic molding lines guarantee Qadri's continued ability to provide highly standardized castings with excellent surface finish. ■

同的铸型。自动翻转功能可保证铸型的精度并防止损坏，并能够控制不同铸型尺寸的变化。通过连续混砂机气动砂门的自动混合功能，能够显著减少砂的浪费，使用自动紧实台避免了手动操作，确保砂子的均匀。

自动造型线的所有特点保证卡德里集团可以稳定提供具有卓越表面光洁度、质量一致的铸件产品。■

## Pioneers In Teaching “Foundry Technology”

### “铸造工艺”教学的开拓者

M5 Engineering Thailand Co. Ltd. is well known for its casting process knowledge, experience and the implementation of high-end technology in the metal casting industries in Thailand.

In a interview with the Foundry-Planet, Jan Wuethrich, Technical Director of M5 Engineering reveals the company's function as a “foundry education mediator” as well some information of the local foundry market potential.

M5 Engineering (Thailand) Ltd. is representing Fondarex Swiss Vacuum Solutions, Wollin Systematic Spraying Technology for light alloys (Non-Ferrous) and pourTECH™ Automatic Pouring Solutions for ferrous (Iron & Steel) foundries.

Since its start in 2013, M5 Engineering Thailand Co. Ltd. established the M5 Academy in cooperation with King Mongkut University of Technology (Thonburi). The objective of the “Academy” is combining fundamental basics of casting technology with the latest “state-of-the-art” machinery to make the future foundryman and women understand the importance of continuous developments that are ongoing to achieve a more efficient casting production and better casting parts.

“In nowadays demanding foundry industries a good technical education is not optional... it is a must! We want to contribute our part and are glad to share our knowledge and experience with the young foundry professionals” - Jan Wuethrich, Technical Director of M5 Engineering

“We have a lot of educational activities here in Thailand together with King Mongkut University of Technology (Thonburi)”, Wuethrich states.

With workshops, tutorials, and presentations, young professionals improve their skills, widen their foundry knowledge, and get familiar with new technologies.

“In the beginning we started with 8 students on Saturday classes... today we have sessions with up to 80 students! Not

M5 工程（泰国）有限公司以其在泰国铸造行业享有的专业技术、经验和先进生产能力而闻名。

M5 公司技术总监 Jan Wuethrich 接受了 Foundry-Planet 的采访，他分享了该公司作为“铸造教育平台”的职能，以及当地的铸造市场信息。

M5 工程（泰国）有限公司是真空解决方案供应商瑞士方达瑞公司、有色合金喷涂技术供应商沃尔林喷涂技术公司以及针对黑色金属（钢铁）铸造厂的自动浇注解决方案——pourTECH™公司的代理商。

自 2013 年成立以来，M5 工程（泰国）有限公司与国王蒙库特理工大学（通武里）合作成立了 M5 学院。“学院”的目标是将铸造技术的基本原理与最新、最先进的机械设备相结合，使未来的铸造从业人员了解行业不断发展的重要性，使生产更加高效、铸件质量更好。

M5 公司技术总监 Jan Wuethrich 表示：“如今，良好的职业技术教育对于要求日趋严苛的铸造行业，不是可有可无的，而是必须的！我们希望贡献自己的一份力量，并很高兴与年轻的铸造专业人士分享我们的知识和经验。我们在泰国与国王蒙库特理工大学（通武里）一起举办了很多教育培训活动。”

通过研讨会、教程和演示，年轻的专业人员可以提升技能、拓宽知识面、熟悉新技术。

“一开始，只有 8 名学生参加周六的课程……现在的参加人数已经达到 80 名！他们中间，不仅有学生，也有积极的年长的铸造从业人员，他们用专业知识支持活动的举办，



only students are joining our activities... also active senior foundry personnel are coming to our seminars to get a deeper insight into product specific topics where our partners are supporting us with their expertise's!

“Make it simple”...If You can't explain it simple, then You do not understand it good enough!

The prime mission of M5 Academy is to transfer foundry knowledge... our presentations and workshops must attract and entertain people. The learning materials need to be interesting and only with quality content! it is a challenging task to make complicated subjects easy to understand... for example how to present a “vacuum” ... or any foundry topics that are not straight forward visible! Therefore, we set priority on digital visualization and real showcases. We must consider the different culture and language barriers!?! This can only be done with a deep “Passion” for the foundry profession, smart leadership, and intercultural competences!

### The Thai Foundry Market

The industries consist mainly of Japanese companies (Automotive, Electronics, Mining) which are main investor in Thailand. There we talk about 200 Ferrous & Non-Ferrous manufacturers of different sizes and different foundry applications/processes. Thailand is also the hub for “jewelry” casters which results in additional countless small investment casting foundries. “Thailand's foundry market offers a lot of opportunities but “on the other hand” also offers a lot of “obstacles on the way”. There is no recipe or advice on how to succeed except that without foundry specific know-how, passion, and pioneer spirit the realization of a project like M5 and its Academy is not possible! ■

使活动主题更加深入。让课程变得简单!” ……如果不能深入浅出地讲解，那么你就没有很好地理解!

M5 学院的主要使命是传授铸造知识……我们的演讲和研讨会必须吸引人，使人们感到有乐趣。因此学习材料必须是有趣的，并且是高质量的内容! 使复杂的话题变得易于理解是一项具有挑战性的任务…例如，如何呈现“真空”…或任何不直接可见的铸造主题! 因此，我们优先考虑采用数字化可视方式来真实展示。我们必须考虑不同的文化和语言因素。只有对铸造行业有深厚的感情、具备卓越的领导才能和跨文化的能力才能做到这一点!

### 泰国铸造市场

泰国铸造业主要由日本的汽车、电子、矿业等公司组成，他们是泰国的主要投资者，大约有 200 家不同规模和各种铸造工艺的有色金属制造商。泰国也是“珠宝”铸造厂的中心，吸引了无数的小型精密铸造企业。泰国铸造市场机会很多，但同时也存在很多“障碍”。对于如何在泰国市场获得成功，是没有任何秘诀或好的建议的，但是，只有拥有像 M5 公司及其学院这样的企业的专业知识、对行业的热情，以及开拓精神，才能实现成功! ■

## LK and NingboTech University Establish Research Center

### 力劲、浙大宁波理工学院成立“增材智造联合研发中心”

On July 6, 2023, LK Group and NingboTech University held the unveiling ceremony of "Joint R&D Center of Additive Manufacturing Technology". Mr. Yang Deren, Academician and President of NingboTech University, Mr. Liu Xiangshang, Founder of LK Group, Mr. Zhang Jun, General Manager of Ningbo LK Technology, Liu Yan'er, Deputy General Manager of Ningbo LK Technology and other representatives of the university and enterprises attended the ceremony.

The cooperation between two sides mainly focuses on three aspects: jointly building an additive manufacturing joint research team, collaborating on scientific research projects, and jointly building a practical base, with the aim to promote the application of surface strengthening of key components and additive manufacturing technology in fields such as die-casting and injection molding equipment. ■

2023年7月6日，力劲集团与浙大宁波理工学院举行了“增材智造联合研发中心”揭牌仪式。浙大宁波理工学院校长杨德仁院士，力劲集团创始人刘相尚，宁波力劲科技总经理张均、副总经理刘燕儿等校企相关代表共同出席了仪式。

本次双方合作主要围绕共建“增材智造”联合科研团队、合作开展科研项目、共建实践基地三个方面，着力于推动关键重要零部件表面强化及增材智造联合技术在压铸与注塑装备等领域中的应用。■

## “China Day” Shines Again at GIFA

### “中国日”再耀德国 GIFA 国际铸造展

In the morning of June 13, the global foundry industry colleagues again focused on the Dusseldorf exhibition center, all invited representatives from foundry organizations, companies, visitors were waiting to join the special theme activity “China Day” organized by China Foundry Association at Booth E01, Hall 15.

Mr. Zhang Libo, President of China Foundry Association, said in his speech: "we return to the GIFA event after four years, and new and old friends gathered again, everyone is incredibly excited."

In recent years, the global economy has inevitably been affected in many ways by the pandemic, and the manufacturing industry has experienced multiple pressures and difficulties in natural resources, transportation and traffic, manpower and



6月13日上午，全球铸造业同仁将目光再次聚焦德国杜塞尔多夫展览中心，在万众翘首企盼中，由中国铸造协会主办的“中国日”特色主题活动于 GIFA 展区 15 号馆 E01 展位成功拉开帷幕！

中国铸造协会会长张立波在致辞中表示：“今天，我们在时隔四年之后重返 GIFA 盛会，经过了三年多的疫情特殊

时期，和新朋老友们再次欢聚，心情无比激动。”

近年来，全球经济不可避免地受到了疫情所带来的多方面影响，制造业经历了自然资源、运输和交通、人力和运营成本等多方压力和重重困难；而中国铸造行业面临着诸多考验，顶住了压力，再次集结在杜塞尔多夫，共襄盛举，共聚 GIFA 展会，铸造企业带着最新的铸造装备与材料，展示出





operating costs; and the Chinese foundry industry has faced many tests and withstood the pressure, gathering once again in GIFA, where foundry companies bring the latest foundry equipment and materials to showcase the advanced technologies and solutions to continue to inject vitality, hope and confidence into the industry.

China is the country with the largest scale, most comprehensive and complete system of the foundry industry, but also the main market for world's high-end foundry equipment, raw and auxiliary materials, technology research and development and its application. According to the exhibition data, the total Chinese exhibitors amounted to 608.

Mr. Zhang Libo pointed out: "The world foundry industry can not developed quickly without the common development of the global foundry and its synergy and progress, so we call for all of us to support each other and continue the cooperation, we sincerely welcome overseas colleagues to participate in the rapid development of China's foundry industry, and work together to establish a green global foundry supply chain."

During the "China Day", China Foundry Association also released the latest data of China's foundry industry and detailed interpretation, which has received great attention from global foundry colleagues.

China Foundry Association hopes that with the cooperation mechanism between international organizations such as Asia Foundry Association and the BRICS Foundry Association, the strength of the global foundry industry will be united to assist member enterprises to continue to make development and innovations in advanced technology and equipment, research and development of raw and auxiliary materials, and bring new vitality and hope to the world foundry industry. ■

最新的技术与方案，为行业继续注入活力、希望和信心。

中国是规模最大、品种最全、体系最完整的铸造大国，同时，也是全球高端铸造装备、铸造原辅材料、铸造技术研发与推广应用的主要市场。根据展会主办方数据显示，本次参展的中国企业达 608 家。

张立波指出：“我们清醒地意识到，铸造行业的发展，离不开全球铸造同仁的共同发展、协同并进，我们呼吁全球铸造人相互扶持与合作，中国铸造诚挚欢迎海外同业者们参与到中国铸造行业的高速发展中来，共同努力建立全球化的绿色铸造供应链体系。”

“中国日”期间，中国铸造协会还现场发布了中国铸造行业的最新数据并做详细解读，得到了全球铸造同行的极大关注。

中国铸造协会作为中国铸造企业的共同组织，希望借助亚洲铸造业联合会、金砖国家铸造业联合会等国际组织间的合作机制，联合全球铸造业的力量，在先进技术和装备、原辅材料的研发等领域协助会员企业继续开拓创新，为世界铸造行业带来新的活力和希望。■

## Asian Foundry Seminar Held during METAL CHINA

# 2023 亚洲铸造业发展与合作研讨会在铸博会期间成功举办

On the morning of May 10th, the "Asian Foundry Industry Development and Cooperation Seminar" was held at the National Convention and Exhibition Center (Tianjin) during METAL CHINA 2023. The event was organized by Asia Foundry Association and co-organized by China Foundry Association. Members of Asia Foundry Association and representatives of more than 40 enterprises participated in this event through online and offline. In addition, Ms. Nalintib Homvisetvongsa, Commercial Minister of Royal Thai Embassy Office of Commercial Affairs in China, Mr. Luong Van Tai, a business entourage of the Vietnamese Embassy in China, were also invited to participate.

Mr. GAO Wei, Secretary General of Asia Foundry Association and Executive Vice President of China Foundry Association, stated in his welcome speech that there was still gap in the development level and scale of the foundry industry among countries and regions in Asia. It is imperative to strengthen regional cooperation, promote the overall improvement of the Asian foundry industry, and develop towards green, intelligent, and high-quality development. "Resource sharing and joint development" is our eternal theme, I hope that all members can make good use of the platform of Asia Foundry Association to explore new models, connect new supply and demand, smooth new industrial chains, strengthen exchanges and cooperation, and jointly promote the development of the foundry industry.

Ms. Nalintib Homvisetvongsa pointed out in his speech that Thailand is located in the center of Southeast Asia, adjacent to multiple countries, and has a superior geographical location. China is one of Thailand's most important trading partners, China and Thailand has conducted mutually beneficial cooperation under the framework of RCEP and other agreements, attracting numerous enterprises to participate. She stated that investing in Thailand not only enjoys the benefits of the China and Thailand Trade Agreement, but also benefits from the free trade agreement signed between Thailand and other countries, which is very beneficial to further expand the international market.

Mr. Luong Van Tai stated in his speech that in 2022, the import and export volume between Vietnam and China reached 175.5 billion US dollars, an increase of 8% year-on-year. China continues to maintain its position as the largest trading partner of Vietnam in ASEAN. As of December 2022, China's total investment in Vietnam reached 23.35 billion US dollars, with a total of 3567 investment projects. The strength and prospects of trade and investment cooperation between



5月10日上午，“亚洲铸造业发展与合作研讨会”在国家会展中心（天津）举行，本次活动由亚洲铸造业联合会主办、中国铸造协会承办。亚洲铸造业联合会各成员及四十多家企业代表均通过线上线下方式参与本次活动，此外，还邀请泰国王国驻华大使馆投资处商务公使郑美云，越南驻华大使馆商务随行梁文才等参会。

亚洲铸造业联合会秘书长、中国铸造协会执行副会长高巍在欢迎辞中表示，目前，亚洲各国家和地区间铸造业的发展水平和规模仍存有一定差距，加强区域合作、推动亚洲铸造业整体提升并向绿色、智能、高质量发展势在必行，“资源共享、共谋发展”是我们永恒的主题，希望各成员单位利用好亚洲铸造业联合会的平台，探索新模式、对接新供需、畅通新链条，加强各国家和地区间的交流与合作，共同促进铸造业的发展。

泰国王国驻华大使馆投资处商务公使郑美云在致辞中指出，泰国位于东南亚国家中心，与多国相邻，地理位置优越。中国是泰国最重要的贸易伙伴之一，中泰在RCEP等协议框架下开展互利合作，吸引了众多企业参与。她表示，在泰投资不仅能享受中泰贸易协定优惠，还能从泰国与其他国家签订的自贸协定中获益，对进一步拓展国际市场十分有利。

越南驻华大使馆商务随行梁文才先生在致辞中表示，2022年，越中双方进出口额达1755亿美元，同比增长8%。越南继续保持着中国在东盟第一大贸易伙伴地位。累积到2022年12月份，中国在越南投资总额达233.5

Vietnam and China are very optimistic.

In the keynote report section, representatives from the Korea Foundry Society, Japan Foundry Society, Vietnam Foundry & Metallurgy-Science and Technology Association, Indonesian Foundry Industries Association, Federation of Malaysian Foundry & Engineering Industries Associations, and the Taiwan Casting Industry Association shared the current development status of the foundry industry respectively. They also introduced the challenges, opportunities, and investment policies faced by the foundry industry.

Taking advantage of this seminar, all parties of Asia Foundry Association will seize the opportunity, strengthen communication, comprehensively and pragmatically promote the establishment of a mechanism for joint consultation, construction, sharing and win-win cooperation, and explore various forms, fields, and levels of communication and cooperation. ■



亿美元，累计投资项目有 3567 个。越中两国贸易投资合作的力度和前景非常乐观。

在主旨报告环节，来自韩国铸造学会、日本铸造协会、越南铸造冶金科学技术协会、印度尼西亚铸造协会、马来西亚机器厂商总会以及台湾铸造业同业公会的代表分享了各国

铸造业发展现状，还对新形势下本地区铸造行业所面临的挑战、机遇以及投资政策等进行了介绍。

借此次研讨会之机，亚洲铸造业联合会各方将紧抓机遇、加强交流，全面务实推动建立共商共建共享共赢机制，在各方面探索开展多形式、多领域、多层次的交流与合作。■

## Hand in Hand, Sharing Prosperity-- BRICS Foundry Association Special Forum Held in Tianjin

### 携手前进，共享繁荣——金砖国家铸造业联合会专题论坛在津举办

On May 10th, the 2023 BRICS Foundry Association Special Forum, themed with "Status of Foundry Industry in BRICS Countries", was held during the 21st China International Foundry Expo (METAL CHINA).

As the current president of BRICS Foundry Association, Mr. Zhang Libo said, "in accordance with the spirit of the Joint Declaration of the 6th BRICS Industry Ministers' Conference, we should continue to strengthen cooperation in areas of industrial chain and supply chain of the foundry industry, digital transformation, green and low-carbon development. By gradually launching online and offline vocational skills competitions for the foundry industry, we aim to promote cooperation in vocational education and international foundry industry association standards.

Mr. Gao Wei, Secretary General of BRICS Foundry Association and Executive Vice President of China Foundry Association, Andrey Dibrov, President of the Russian

5月10日，以“金砖国家铸造业现状”为主题的2023金砖国家铸造业联合会专题论坛在第二十一届中国国际铸造博览会期间举办。

作为金砖国家铸造业联合会当值会长，张立波在致辞中表示，根据《第六届金砖国家工业部长会议联合宣言》精神，我们要持续加强铸造业产业链、供应链合作、持续加强铸造业数字化转型合作、加大铸造业绿色低碳合作。通过逐步开展线上线下铸造职业技能大赛活动，促进职业教育的合作和国际铸造业团体标准的合作。

金砖国家铸造业联合会秘书长、中国铸造协会执行副会长高巍，俄罗斯铸造协会会长安德烈·迪布罗夫，印度铸造行业协会会长贾恩、前会长潘查尔，南非铸造协会会长帕尔多以及金砖国家铸造业联合会理事会代表以线上线下相结合的方式参会，本次会议还特邀了欧洲铸造协会秘



Association of Foundrymen, Subodh Panchal, Past President, and Vinit Jain, President of IIF, Mr. Nigel Pardoe, President of South African Institute of Foundrymen and Marina Biljon, Executive Administrator, and representatives of the BRICS Foundry Association Council attended the meeting online and onsite. Dr. Fynn-Willem Lohe, Secretary General of the European Foundry Association, was also specially invited to attend this meeting and he made an online speech about the European perspective on the current situation of foundry industry.

During the Q&A and discussion sessions, participants expressed their opinions and provided information and suggestions for promoting deep communication and cooperation among foundry enterprises in the BRICS countries. ■

书长 Dr. Fynn-Willem Lohe 博士为大家带来了来自欧洲铸造同业的 2023 年最新数据和分析。

在问答与讨论环节，大家各抒己见，为促进“金砖国家”铸造企业彼此更深入地交流与合作提供了资讯和建议。■

## 4th Diecasting CEO Summit & High-level Forum for Lightweight Nonferrous Casting to held in November

### 压铸及轻量化铸造峰会将于 11 月举办

To meet the carbon goal and with the rapid development of new energy vehicles, "giga diecasting" industry has ushered in the best era, and lightweight casting has become the trend. In order to support the sustainable development of China's die-casting and lightweight casting industry, the "4th Diecasting CEO Summit & High-level Forum for Lightweight Nonferrous Casting to held in November", organized by China Foundry Association, will be held from November 23-26 in Zhuhai, Guangdong-the forefront of reform and opening up. It will be a perfect platform to share development achievements, promote application, and look forward to directions.

Since 2016, the summit has been successfully held for

在“双碳”目标下，以及随着新能源汽车的快速发展，“一体化压铸”已经迎来最好的时代，轻量化铸造已成为大势所趋。为了助力中国压铸及轻量化铸造事业的可持续发展，分享发展成就、推广发展成果、前瞻发展方向，由中国铸造协会主办的“2023 第四届压铸 CEO 峰会暨有色铸造轻量化高层论坛”将于 11 月 23-26 日在改革开放前沿阵地的广东珠海举办。

自 2016 年起，峰会已成功举办三届，每届参会人数达到近 800 人，其中企业高管占比约 70%，真正打造了一个高端且极具影响力的行业交流平台。

three sessions, with nearly 800 attendees of each session and executives participants accounting for about 70%, which truly creating a high-end and highly influential industry platform.

With the theme of "Empower a New Era with Technology", the summit will focus on new technologies and developments in giga diecasting, low-pressure casting, extrusion casting, semi-solid casting, etc.. There are a series of topics, including "Global Diecasting Industry Development Trends and Market Analysis", "Seminar on Advanced Technology of Die-casting, Low-pressure, Extrusion, and Semi-solid", and "CEO Dialogue". Focusing on cutting-edge technologies, hot topics and innovations, it will support high-quality development and empower integration into the new era. ■

本届峰会以“科技赋能新时代”为主题，将围绕大型一体化压铸、低压铸造、挤压铸造、半固态铸造等领域的新技术、新发展进行研讨，设立“全球行业发展态势及市场分析”、“压铸、低压、挤压及半固态先进技术研讨会”、“CEO 高端对话”等多个板块，聚焦前沿、关注热点、引领创新，为高质量发展助力、为融入新时代赋能。更多会议信息或会议报名，请联系：陈海阔 13381183827 ■

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## Kuka Sells Automation Integration Subdivision

### 库卡出售自动化集成部门

KUKA has signed an agreement to divest its robotic automation integration division KUKA Industries GmbH & Co. KG, Obernburg to Aretè Cocchi Technology, Italy, and Fai Holding, Switzerland. The transaction will be closed by June 30.

The division focuses on highly customized automation solutions and special machinery for welding, cutting, casting and laser processing, as well as for automation in packaging, food processing and ancillary industries. The buyer is a collaboration between Italian technology company CT Pack, part of the Aretè Cocchi Technology Group (ACT) based in Italy, and FAI Holding AG (FAI), an investment company based in Switzerland, specialized in relaunching historical brands active in technology and automation.

"With the new ownership we have found a better fit with the business model and a unique strategic perspective for KUKA Industries and its employees. This includes more independent sales structures and higher visibility in the market", says KUKA CEO Peter Mohnen.

"With this acquisition, we will strengthen our packaging, automation and robotics business," says Gino Cocchi, Chairman of ACT. "We see great potential in the robotics integration know-how of KUKA Industries Obernburg for complementary markets of our existing activities, as we plan to expand the business supported by our international network in Europe, America and Asia."

Luigi Maniglio, Senior Partner of FAI, adds: "We are proud of having favored the conclusion of such an important industrial transaction. We have conceived a

库卡已签署协议，将其位于奥伯堡的机器人自动化集成部门库卡工业公司出售给意大利的阿雷泰·科奇科技公司和瑞士的Fai控股公司。交易于6月30日前完成。

该部门专注于定制化程度高的自动化解决方案，用于焊接、切割、铸造和激光加工的特殊机械设备，以及包装、食品加工和其他辅助行业的自动化设备。买方是意大利科技公司阿雷泰·科奇科技公司（ACT）下属的CT Pack公司和总部位于瑞士的投资公司FAI控股集团（FAI），该投资公司专注于推动活跃在技术和自动化领域的老牌企业的发展。

库卡首席执行官彼得·莫宁表示：“有了新的归属后，我们找到了适合库卡工业及其员工的更好的商业模式以及战略方案，包括更独立的销售结构和更高的市场知名度。”

ACT 董事长吉诺·科奇表示：“此次收购将加强公司的包装、自动化和机器人业务。公司计划将扩大欧洲、美国和亚洲的市场业务，我们认为位于奥伯堡的库卡工业机器人集成技术在满足市场需求方面具有巨大潜力。”

FAI 控股公司的高级合伙人路易吉·马尼格里奥补充说：“我们为促成如此重要的工业交易而感到自豪。我们已经为库卡工业制定了一项长期的重新启动计划，

long-term relaunch plan for KUKA Industries Obernburg, starting with reviving its former iconic brand ‘Reis Robotics’ and revitalizing products such as the ‘RobotStar’ control. We look forward to the unique combination with Aretè Cocchi Technologies, an Italian excellence in technology and automation. Reis Robotics is back and will return to be a reference in the industry.”

KUKA had acquired Reis Robotics in 2013 and changed its name to KUKA Industries GmbH & Co. KG in 2016. ■

首先是复兴其前标志性品牌 ‘Reis Robotics’，并振兴 ‘RobotStar’ 控制产品。我们期待着与阿雷泰·科奇科技公司的独特融合，这是意大利在技术和自动化领域的杰出品牌。徠斯机器人回来了，并将再次成为业界的标杆。”

库卡于 2013 年收购了徠斯机器人，并于 2016 年更名为库卡工业。■

## Bühler Unveils its Megacasting Carat 840 for the First Time in Europe

### 布勒 Carat 840 超大型压铸机亮相欧洲

Bühler was presenting its megacasting solution, the Carat 840, to customers and partners for the first time in Europe at the “Megacasting unveiled” event in Austria. From June 13 to 16, representatives of the die-casting and automotive industry had the unique opportunity to experience the solution live, to take a tour through and around the Carat 840 accompanied by the Bühler’s experts, and to learn more about the entire die-casting process. With this cutting-edge equipment, Bühler’s customers can produce structural castings for automotive body-in-white assemblies and with that reduce complexity in production, minimize production costs, and lower CO<sub>2</sub>e (CO<sub>2</sub> equivalent) emissions.

#### Bühler megacasting solutions with clamping units built by ENGEL

The event took place in St. Valentin, Austria, is due to the simple fact that this is the home of long-time partner ENGEL. Bühler and ENGEL are working together in the field of die casting for decades. The clamping units for the megacasting systems developed by Bühler are built by ENGEL. ENGEL’s extensive know-how in the construction of large-scale plants complements Bühler’s innovative solutions.

#### The power of collaboration

Together with partners, Bühler rethinks, designs, and commissions entire solutions and can therefore offer process solutions from ingot to the body shop. At the event in Austria in June, partners involved in the process presented their area of expertise within the die-casting cell. Visitors have the chance to gain insights into die design, efficient melting of aluminum, tempering and spraying of the die, and much more. As the core of the cell, the Bühler Carat series enables parts to be cast at the highest quality.

6月13-16日，布勒在奥地利展示大型一体化压铸解决方案 Carat 840，属首次在欧洲亮相。压铸和汽车行业的代表有机会在布勒专家陪同下参观 Carat 840，现场体验解决方案，了解更多关于一体化压铸工艺的信息。凭借这一先进设备，布勒的客户可以引领白车身制造革命，有效降低综合成本和车身复杂性，减少二氧化碳排放。

#### 布勒与 ENGEL 锁模系统共促一体化压铸解决方案

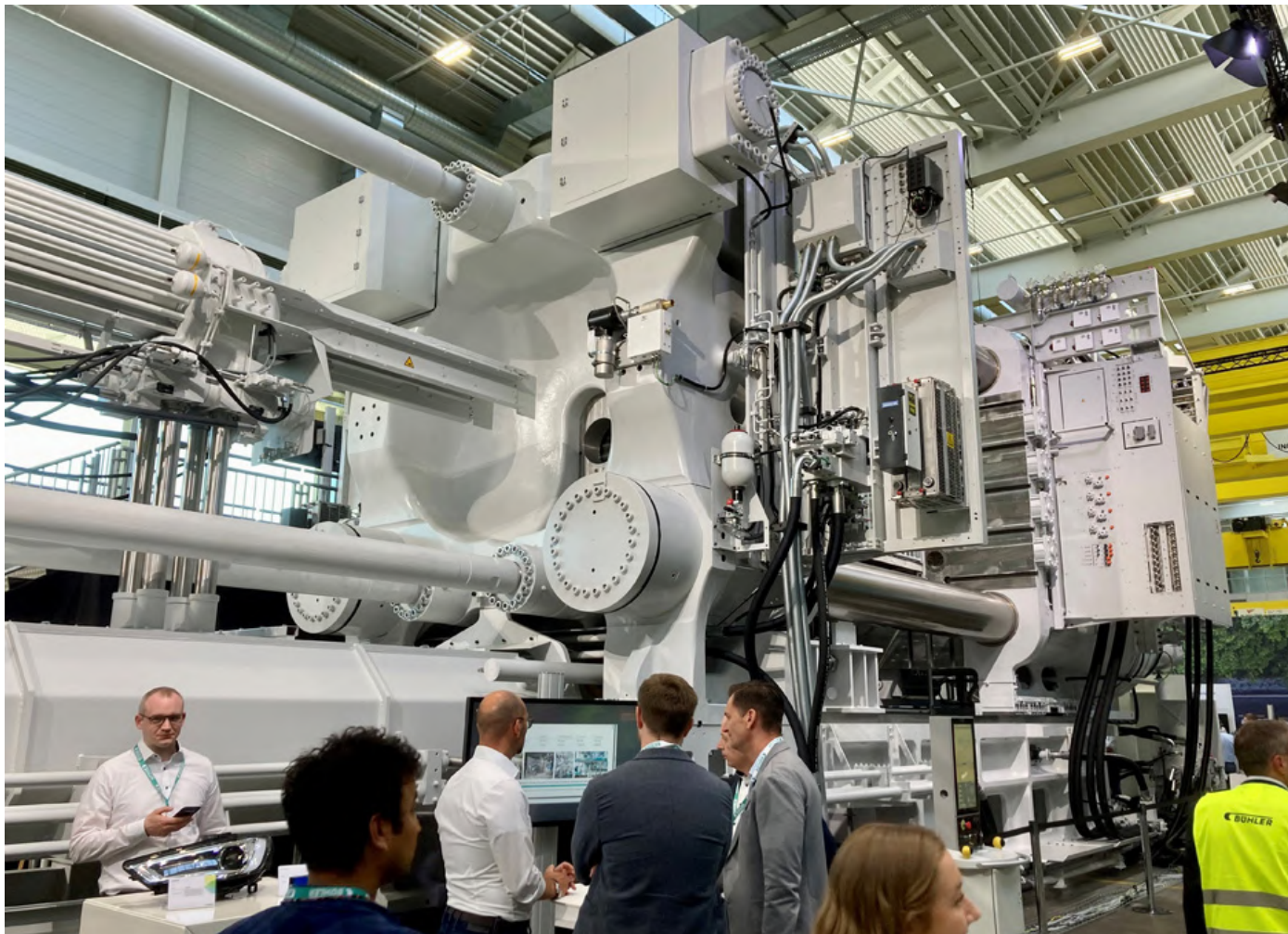
“开放日”活动在奥地利圣瓦伦丁举行，原因很简单，因为这里是布勒长期合作伙伴 ENGEL 公司的所在地。布勒和 ENGEL 是几十年的合作伙伴。布勒开发的大型压铸系统的锁模装置由 ENGEL 公司提供。ENGEL 在大型工厂建设方面具备丰富的专业知识与布勒的创新解决方案相辅相成。

#### 合作的力量

布勒公司与其合作伙伴一起重新思考、设计和执行整个解决方案，因此可以提供从铸锭到车身制造的全流程解决方案。在 6 月份的奥地利开放日活动上，布勒公司的合作伙伴分享了他们在压铸生产方面的技术和经验。参观者有机会深入了解模具设计、铝的高效熔炼、模具的回火处理和喷涂等。作为压铸单元的核心，布勒的 Carat 系列压铸机能够生产出质量最高的铸件。

#### 布勒先进材料——汽车行业的合作伙伴

布勒研发的先进材料不仅为汽车行业提供压铸生产



### Bühler Advanced Materials – partner for the automotive industry

Bühler's Advanced Materials business not only provides die-casting solutions for the automotive industry but also actively engages in the fields of battery production and sensor coating, thereby offering key solutions for the vehicle of the future. "With the broad portfolio in our Advanced Materials business, we offer innovative and state-of-the-art solutions for the automotive industry," says Marcel Natterer, CEO Advanced Materials at Bühler.

By exploiting the synergies in the different core competencies of both companies, new solutions in die casting are thus always possible. "The implementation of the clamping units for the currently largest machines in Bühler's portfolio - the Bühler Carat 920, which was built in our ENGEL plant in Asia, and the Bühler Carat 840 in St. Valentin - are milestones for us of which we are very proud," Stefan Engleder and Franz Füreder, Head of the Automotive Business Unit at ENGEL, emphasize the importance of the cooperation with Bühler.

解决方案，还积极服务于电池生产和传感器涂层领域，为未来的汽车提供关键解决方案。布勒先进材料公司的首席执行官马塞尔·南特表示：“凭借先进材料业务的产品组合，我们可以为汽车行业提供创新和最先进的解决方案。”

两家公司通过核心竞争力的协同作用，使压铸领域的创新解决方案成为可能。“目前，布勒产品组合中最大压铸机 Carat 920 的锁模系统由我们提供，在 ENGEL 公司的亚洲工厂建造，Carat 840 的锁模装置在圣瓦伦丁工厂生产，对我们来说，这是里程碑的发展，我们为此感到非常自豪，” ENGEL 公司汽车业务负责人斯特凡·恩格尔德和弗朗茨·福尔德，强调了与布勒公司合作的重要性。

布勒压铸业务总经理科内尔·门德勒表示赞同，两家公司联合举办本次活动是一个强烈的信号，他表示：“与 ENGEL 公司的合作以及对未来创新解决方案的共同追求



Cornel Mendler, Managing Director Die Casting at Bühler, also agrees. For him, the joint presentation of the two companies is a strong signal. "The cooperation with ENGEL and our joint pursuit of innovative solutions for the future can create great and powerful things - the Carat 840 is a symbol of this."

At the event in St. Valentin (Linz), Austria, Bühler showcases its megacasting technology with 8,400 tons locking force to international representatives of the die-casting and automotive industry for the first time in Europe. With a height of 7.6 meters and a floor area of around 160 square meters, the Carat 840 can inject over 200 kilograms of liquid aluminum into a die within milliseconds.

### Sustainability as a driver for aluminum die casting

Apart from the reduction in complexity, aluminum castings have the potential to drastically reduce CO2 emissions in manufacturing, with fewer processing steps and especially when using renewable energy or electric melting. CO2 per part is also reduced by minimizing waste and using low CO2 aluminum alloys. The aluminum that goes into overflows and runners can be remelted directly and reused in the die-casting cell, thereby avoiding transport for recycling.

"Our internal studies show that compared to benchmark emissions today, megacasting offers the potential to reduce CO2 emissions by 70%. This can be achieved by using aluminum alloys with low CO2 footprint, avoiding fossil fuels for melting, and powering all operations with renewable electricity. This allows car manufacturers to reduce the carbon footprint of their products," explains Martin Lagler, Global Director Product Management & Marketing Die Casting at Bühler Group. ■

可以创造出大而强的作品——Carat 840 就是一个证明。”

在奥地利圣瓦伦丁（林茨）举行的活动上，布勒公司首次在欧洲向压铸和汽车行业的全球参会代表展示了其 8400 吨锁模力的大型压铸机。Carat 840 高 7.6 米，占地面积约 160 平方米，可以在几毫秒内将 200 多公斤的液态铝注入模具。

### 可持续发展是铝合金压铸技术的内驱力

除了降低生产复杂性外，铝铸件在生产过程中可以大幅减少二氧化碳的排放，减少加工步骤，尤其是在使用可再生能源或电炉时。通过最大限度地减少浪费和使用低碳的铝合金材料，还降低了生产每个零件产生 CO2 的排放。进入溢流和流道的铝液可以直接进行重熔，并在压铸单元中重复使用，从而避免了回收及运输。

布勒集团全球压铸事业产品管理和营销总监马丁·拉格勒说：“内部研究表明，与当前的基准排放量相比，大型压铸机通过使用二氧化碳排放量低的铝合金，无需使用化石燃料进行熔化，并且通过可再生电力提供动力有可能将二氧化碳排放量减少 70%。汽车制造商将能够减少其产品的碳足迹。” ■



## Newcast Award 2023 for the Best Substitution

## 2023 年 Newcast 获奖作品揭晓

This prestigious award is presented every 4 years at GIFA, the world's largest foundry trade fair, to companies that stand out for their exceptional performance in their industry. For Miguss GmbH Heiligenhaus it was a great honour to receive this prestigious award. The Newcast Award for Best Substitution is presented by a distinguished jury of respected experts and industry leaders.

The winning work is a pulse generator module for a coal power plant manufactured by gravity die casting using ALSi11-EN AC-44000 material.

Without their continued and fruitful collaboration within the company, this award would not have been possible. "This is an essential part of the success" Peter and Alexander Mies were pleased to say when they received the award and they are counting on continuing to make a good contribution to the further development of the industry.

As winners of the Newcast Award, they will continue to strengthen their commitment to excellence and innovation. They will intensify their efforts to provide customers with even better products/services, continue to invest in research and development to develop innovative solutions that meet the needs of their customers.

Source: [www.miguss.de](http://www.miguss.de). ■



Newcast 创新铸件奖，这一久负盛名的奖项每 4 年在全球最大的铸造博览会 GIFA 上颁发，授予表现突出的公司。对于 Miguss GmbH Heiligenhaus 公司来说，获得该奖项是莫大的荣誉。Newcast 创新铸件奖由备受尊敬的专家和行业领袖组成的评审团评选颁发。

获奖作品是用于煤电厂的脉冲发生器模块，该模块采用 ALSi11 EN AC-

44000 材料和重力铸造工艺。

如果没有公司内部持续而富有成果的合作，是不可能获得这个奖项的。“这是成功的重要组成部分，” Peter 和 Alexander Mies 在获奖时高兴地说，他们期待着继续为行业的发展做出更多的贡献。

作为 Newcast 奖的获奖者，他们将继续加强对卓越和创新的承诺。他们将继续努力为客户提供更好的产品和服务，并继续加大研发投入，开发满足客户需求的创新解决方案。■

## The Investment Casting Industry Visits Blank

## 精密铸造行业代表参访 Blank 公司

The European Investment Casters' Federation (EICF) welcomed investment casters and suppliers from all over the world to the thirtieth EICF Conference & Exhibition in Bregenz.

The federation has set itself the task of creating a worldwide exchange and representing the interests of the investment casting industry. Part of the work involves

世界各地的精密铸造企业和供应商参加了在布雷根茨举行的第 30 届欧洲精密铸造企业联合会会议暨展览会。

欧洲精密铸造企业联合会代表着精密铸造行业的利益，旨在为精密铸造业搭建一个国际交流平台。其活动

organising an annual conference where all the players in the market meet. This year, this took place from 8 to 10 May 2023 in Bregenz. Beside interesting technical presentations and an integrated trade fair on investment casting, the programme also included a company visit to BLANK. Thus, the BLANK-Group had the pleasure of welcoming approx. 120 guests from all over the world to Riedlingen on 10 May 2023.

Werner Blank, former Managing Director at BLANK, opened the event by reporting on his many years in the industry. "I was active in the EICF myself and am particularly pleased that BLANK is now opening its doors to visitors as host," he said in his speech. Philippe Hoste, Chairman of the EICF, and Carlos Olabe, CEO of the EICF, expressed their gratitude for the visit and the opportunity to experience the production at BLANK. Mayor Marcus Schafft was also a guest. In his speech, he introduced the town of Riedlingen to the visitors and the importance of BLANK as the largest employer in Riedlingen for the region. Finally, Alexander Lenert, Managing Director of the BLANK-Group, gave an insight into the processes at BLANK in a short presentation. Afterwards, the tour of the company started which led through all the production departments in the company.

"The open casting in the foundry is always particularly impressive," said Lenert, "The automated handling of the shells by a casting robot was also a highlight here. Especially in this day and age, an exchange is particularly important for innovations and the further development of the industry. We were very pleased to be part of the EICF event and thus to be able to make our contribution to this beautiful event." ■

范围包括组织年度会议，邀请所有行业代表参会交流。今年的年会已于2023年5月8-10日在布雷根茨举行，除了内容丰富的技术论坛和精密铸造展览外，还包括5月10日的BLANK公司参访活动，来自世界各地的约120位代表来到里德林根参观了BLANK公司。

Blank公司的前董事总经理Werner Blank在活动开始介绍了他多年在精密铸造行业的经历。他说：“我也积极参加欧洲精密铸造企业联合会的活动，特别高兴BLANK公司今天作为东道主，迎接各位的到来。”欧洲精密铸造企业联合会会长Philippe Hoste和首席执行官Carlos Olabe对此次活动的举办以及能有机会在BLANK公司体验实操生产表示感谢。市长Marcus Schafft先生也参与了活动，他向参观代表们介绍了里德林根镇，并表示作为里德林根的最大雇主，BLANK公司对该地区发展是非常重要的。最后，在BLANK的董事总经理Alexander Lenert简要介绍了BLANK公司的生产工艺之后，参会代表们参观了公司所有的生产部门。

Lenert说：“铸造厂的开放参观总是令人印象深刻，机器人自动搬运壳体也是这里的一大亮点。特别是在现如今，行业交流对行业的创新发展尤为重要。我们很高兴能参加欧洲精密铸造企业联合会的活动，并为这次活动的成功举办贡献自己的力量。” ■



## Fin-Raahe Valimo Oy - Sand in the Foundry was Always in the Wrong Place

## 从 Fin Raahe Valimo Oy 铸造厂看砂再生

Thomas Fritsch, Chief Editor of Foundry-planet  
Foundry-planet 主编 Thomas Fritsch



The former company Finn Recycling, now Resand, has developed a technology for the treatment/regeneration of foundry sand and a modular sand recovery plant that uses this technology. The reclamation plant treats waste sand thermally and mechanically to increase the recycling rate of foundry sand and reduce the consumption of virgin sand.

The company has been treating waste sand from three Finnish foundries in Nuutajärvi since 2019. After installing a plant at the TU Freiberg test foundry in Germany, the Finnish steel foundry Raahe Valimo Oy has been working with the RESAND plant since the beginning of 2023.

### Sand preparation in the foundry-an onsite visit

We met for the on-site appointment and were able to talk to the CEO Timo Kronqvist and the foundry manager about the first experiences in use. Raahe Valimo Oy was founded in 1919 and still operates as a sustainable steel foundry for well-known customers throughout Europe. The company produces about 1,000 tonnes of steel castings a year in various sizes between 10 and 5000kg.

Timo Kronqvist emphasizes that the Finnish foundry naturally sets the highest standards for sustainability and considers the circulation of raw materials and auxiliary materials

Resand 公司的前身是 Finn Recycling，成功开发了一种铸造砂处理 / 再生技术，并成立了使用该技术的模块化砂再生厂。砂再生厂对废砂进行热法再生和机械再生，以提高废砂的回收率，减少原砂的消耗。

自 2019 年以来，该公司与位于努塔杰尔维的 3 家芬兰铸造厂合作砂再生。芬兰铸钢厂 Raahe Valimo Oy 公司在德国 TU Freiberg 测试厂安装了一套砂再生设备后，自 2023 年初以来一直与 Resand 公司合作。

### 现场了解砂处理

我们进行了参观预约，并与首席执行官 Timo Kronqvist 和铸造经理交流了使用体验。Raahe Valimo Oy 公司成立于 1919 年，目前仍作为一家可持续发展的铸钢厂为欧洲各地的知名客户服务。该公司每年生产约 1000 吨铸钢件，重量在 10-5000 公斤。

Timo Kronqvist 强调，芬兰铸造厂一定会在可持续发展方面设定最高标准，并关注原辅材料的循环使用。以前，生产 1000 吨的铸钢件需要约 2500 吨硅砂，其中大部分是

carefully.

The 1,000t of steel castings, used to require about 2,500t of silica sand, which was most imported from Belgium by ship. The waste sand was used to be dumped in landfills, but this is no longer permitted. Kronqvist stated: "If you are geographically located in the middle of Finland, the sand is usually just in the wrong place". This was also the case when the sand was processed in Nuutajärvi near Finn Recycling 3 years ago, but even then, the distance of 600 km was always an obstacle.

This was the reason for installing sand processing directly on site at the foundry.

Since the beginning of 2023, the Finn Recycling (now RESAND) plant has now been in operation and the Raahe foundry has initial findings and figures.

### The Advantages are as follows:

- No landfill problems, no logistic problems
- About 2,200 t of new sand can be saved per year
- Better sand, smaller grains
- Less binder necessary
- Better casting quality and surface

According to Timo Kronqvist, setting up the leased plant has already paying off and makes him independent of transport logistics and the strict regulations for landfills in Finland. Of course, it was an advantage that he had the sand processed in Nuutajärvi before, so he knew the good quality and the people from the technology.

The company's own sandplant usually runs 24 h/day, does not require much maintenance, and runs stably. When the moulds are crushed from used sand with the existing Neuhof plant, the sand can be taken directly to the sand regeneration plant, which is located directly in front of the foundry buildings. During the joint tour, we were able to see for ourselves the efficiency of the Raahe foundry and the sand reclamation system. The Finns have shown that the system works, especially on site.

### About RESAND

RESAND Oy is a Finnish technology company specializing in sand regeneration. RESAND offers foundries more environmentally friendly and profitable solutions for the use of sand. After a long period of research, RESAND has patented a regeneration technology that allows foundry sand to be processed for reuse. This significantly reduces the extraction of new, depleting sand resources, as well as the CO2 emissions and cost of handling and transporting them. This unique regeneration technology also significantly reduces the amount of waste sand and the need for landfills.

RESAND has developed the regeneration technology in Nuutajärvi in cooperation with several foundries and universities for almost 10 years. The Sand As A Service (SAAS) service model for foundries also enables rapid implementation with low investment. RESAND's mission is to innovate the use and recycling of foundry sand together with its customers and thus be part of the solution to a global environmental challenge. ■

通过船运从比利时进口的。废砂曾经被倾倒在垃圾填埋场，但现在已经不允许这样做了。Kronqvist说：“如果在芬兰中部，砂子通常就被错误地处置”。3年前，当砂子在 Finn Recycling 公司附近的 Nuutajärvi 加工时也是如此，但是当时，600 公里的距离也是一个障碍。

这就是需要直接在铸造厂安装砂再生设备的原因。

自 2023 年初以来，Finn Recycling（现为 RESAND 公司）一直处于正常经营中，与 Raahe 铸造厂的合作已经有了初步发现和数据。

### 优点如下：

- 没有垃圾填埋问题，没有运输问题
- 每年可节约使用新砂约 2200 吨
- 更好的砂子，更小的颗粒
- 粘结剂用量小
- 获得更好的铸件质量和表面质量

Timo Kronqvist 表示，新建工厂已经看到了实效，无需运输并且可以满足芬兰对垃圾填埋场的严格规定。当然，他以前在 Nuutajärvi 接触过砂再生，这是一个优势，所以他知道回收砂的质量和技术水平。

该公司自己的砂处理厂通常 24 小时全天运行，运行稳定且不需要太多维护。当 Neuhof 工厂落砂后，废砂可以直接运送到位于铸造车间正前方的砂再生车间。参观期间，我们亲眼目睹了 Raahe 铸造厂和砂再生系统的高效率。芬兰企业已经证明该系统是有效的，尤其是在现场的操作处理上。

### 关于 RESAND 公司

RESAND Oy 是芬兰一家专门从事砂再生处理的科技公司。RESAND 公司为铸造厂提供更环保、更经济的铸造用砂解决方案。经过长时间的研究，RESAND 公司获得了一项专利，该技术可以对铸造用砂进行再生，可以减少新砂的使用和砂资源的开采，降低二氧化碳排放和运输成本。这种独特的再生技术还显著减少了废砂排放以及对垃圾填埋场的需求。

RESAND 与多家铸造厂和大学合作，在 Nuutajärvi 开发砂再生技术已有近 10 年。铸造厂的砂再生服务（SAAS）模式也能够实现低成本和快回报。RESAND 公司的使命是与客户一起创新铸造砂的使用和回收技术，使之成为应对全球气候变化解决方案的一部分。■

## European Foundry Women's Award 2023

## 2023 年欧洲优秀女铸造工作者奖项揭晓

Thomas Fritsch, Chief Editor of Foundry planet  
Foundry planet 主编 Thomas Fritsch

The European Foundry Women's Award 2023 was awarded this year by the jury of CAEF (The European Foundry Association) to Italian professor Annalisa Pola, followed by Amandine Miot of EJ France in 2nd place and Ghyslaine Delpierre, Ferry-Capitain France in 3rd place. During GIFA and Newcast in Düsseldorf in June, the award was presented in a fitting ceremony by Assofond President and CAEF member Roberto Ariotti.

FP: Annalisa, congratulations on receiving this award during GIFA 2023 in Düsseldorf. How important are these recognitions in our days?

Annalisa Pola: Thank you very much, I am really grateful, happy and honored to have received this award which represents for me an important recognition of my passion for research and education in the field of foundry and metallurgy.

I believe that this type of awards is very important, and not only for the person who receives it, whose satisfaction is obviously great, but also for others. In general, every award, but perhaps this more than others given its purpose, can be a stimulus for women working in this sector, and a signal that things are changing and, above all, that there is the willingness to change them.

And I thank the CAEF for having decided to start this project last year, because it is true what they report, i.e. that the integration of everyone's talent will help to address the important challenges we have to face to transform our industries and economies towards a more sustainable future.

FP: How has the overall position of women in the engineering world changed and where is it developing?

Annalisa Pola: As well known, the exclusion or severe limitation of women's access to technical-scientific studies and professions has ancient social and cultural roots, and definitely engineering is one of those fields considered typically male, especially in certain areas, such as mechanical or information engineering, etc.

Lately (and luckily), however, things have been changing, easily thanks to the breaking down of those social and cultural barriers that kept women away from studying technical topics, but also thanks to a change in the mentality of the industry that does not preclude women from accessing certain positions.

For example, in my country, Italy, the percentage of female students enrolled in STEM faculties has risen to around 25 per cent; the data in other countries are almost similar, somewhere lower somewhere higher, anyway this gives hope for a

今年，欧洲铸造协会（CAEF）评审团将“2023年欧洲优秀女性铸造工作者”荣誉授予了意大利布雷西亚大学教授安娜丽莎·波拉，以及来自EJ法国公司的阿芒迪娜·米奥特，和Ferry Capitain法国公司的Ghyslaine Delpierre。今年6月在杜塞尔多夫举行的铸造展GIFA和铸件展Newcast的颁奖典礼上，意大利铸造协会（Assofond）主席兼欧洲铸造协会会员Roberto Ariotti为他们颁奖。

FP: 你好，安娜丽莎，祝贺你在杜塞尔多夫举行的2023年GIFA颁奖典礼上获奖。在当今时代，你觉得获得这样的认可重要么？

安娜丽莎·波拉：非常感谢，能获得这个奖项，我感到非常高兴且荣幸，这是对我在铸造和冶金领域的研究和教育工作极大的认可。

我认为，这类奖项的颁发是非常重要的，不仅对获奖者是重要的，显然他们很满意，而且对其他人来说也是如此。尤其是，这个奖项比其他奖项更能激励女性铸造工作者，并发出一个信号，行业正在发生变化，最重要的是，已经具备了改变行业现状的意愿。

非常感谢欧洲铸造协会于去年启动了 this 评选项目，确实正如他们所做的报告，将每个人的智慧汇聚起来，将有助于解决我们必须面临的重要挑战，从而使我们的行业和经济变得更可持续。

FP: 女性在工业界的整体地位发生了怎样的变化？未来将向哪里发展？

安娜丽莎·波拉：众所周知，排斥或限制女性从事技术科学研究的职业有着深厚的社会和文化根源，工业行业无疑被认为是典型的男性职业领域之一，尤其是在某些领域，如机械或信息工程等。

然而，最近（幸运的是）情况发生了变化，首先，这要归功于阻碍女性学习技术知识的社会、文化障碍被打破了，也要归功于行业心态的改变，即允许女性获得某些职位。

例如，在意大利，机械工程学院招收的女生比例已升至25%左右，其他国家也是类似的比例，有些国家低一些，有

continuous growth.

Globally, what is still existing is a certain salary gap: women engineers generally earn less than men (85-90%).

But even this I hope will change in the short term thanks to the activities that nowadays are promoted to achieve gender equity in the profession. And the recognition of women's work in some areas, such as that promoted by the CAEF, I think can help in paving the way for these changes.

FP: What do you take away from GIFA and what is the significance of leading trade fairs and where is the foundry industry heading?

Annalisa Pola: Well, trade fairs like GIFA have different purposes, first of all the obvious one of showcasing the latest innovations in the sector

at various levels, that is, from equipment to services including education and research. It is also an important opportunity for experts to meet, both customers and competitors, and this is always a motivation for comparison and growth. Even I, although not working directly in the sector being an academic, I had the opportunity to discuss with several specialists and become aware of interesting advances and curiosities that I will certainly transfer to my students during next semester's courses.

The foundry world is experiencing a continuous growth, with innovations in processes, materials, data analysis etc. and I believe that the collaboration with the university for both research and education is of fundamental and mutual importance to achieve ambitious goals.

"Young women should follow their passions and talents and be more involved and encouraged in engineering professions."

FP: Where do you see the most important tasks especially in the university sector?

Annalisa Pola: The relationship between universities and industry, including foundry, has changed a lot in recent years. Collaborations with companies for research but also for education have strongly intensified, although some fear in sharing their know-how with the academic world is still present in many foundries. It is therefore also the task of us academics to convince companies that this exchange of knowledge and the creation of joint projects are necessary to produce innovation and competitiveness, and to educate competent and passionate graduates engineers and technicians oriented to this sector, with obvious consequences for economic growth.

If we now focus on the issue of women in engineering,



些国家则更高，无论如何，这都给持续增长带来了希望。

但是，在全球范围内，仍然存在一定的工资差距，即女性工程师的收入通常低于男性（仅为男性的 85-90%）。

尽管如此，我希望这一情况在短期内会有所改变，这要归功于现在为实现职业性别平等而开展的活动。我认为，认可女性在某些领域的工作成绩，比如欧洲铸造协会所开展的活动，可以为行业职业性别平等的转变铺平道路。

FP: 您从德国铸造展 GIFA 中学到了什么？您认为展会的意义是什么？铸造行业的发展方向是什么？

安娜丽莎·波拉：像 GIFA 这样的展会可以满足不同的参展目的，首先是可以了解到行业各领域的最新发展，从设备到服务，包括教育和研究方面；也是企业与客户和竞争对手会面的机会，通过同台竞技，提供发展动力。就我而言，尽管我不直接从事行业工作，我也有机会与几位专家讨论，并在新的学期将我了解到的行业创新发展与有趣的事情讲给我的学生们。

铸造行业在不断的发展，在工艺、材料、数据分析等方面进行了创新。我相信，行业的产学研合作对于实现伟大的目标至关重要。

“年轻女性应该追随自己的激情和才华，得到更多的鼓励，并更多地从事工业工程领域的职业。”

FP: 您认为大专院校当前最重要的工作是什么？

unfortunately, still few girls choose to pursue studies in technology, and even fewer choose careers in technical fields. Therefore, I believe that one of the aims that the university must set itself is to insist on promoting technical studies towards high school female students, or even before, through various activities, including practical ones (such as internships, etc ..) to convince young women to follow their passions and attitudes and not to see a degree in a technical sector as an impossible achievement that is not worth taking. ■

安娜丽莎·波拉：近年来，大专院校与包括铸造业在内的行业之间的关系发生了很大变化。尽管很多铸造企业仍然不太愿意与学术界分享他们的专业知识，但企业间、产学研方面的合作已经大大加强。因此，学院的工作是要说服企业，让他们认识到知识交流和校企合作对于推动行业创新和提升竞争力是必要的，而且学院承担着培养有能力、有激情，且面向行业、拉动经济增长的工程师和技术人员的任务。

虽然我们现在非常关注女性在工程领域的从业问题，然而，选择和从事工程技术专业和职业的女性偏少。因此，我认为，大学必须为自己设定的目标之一是坚持通过各种活动提高对高中阶段甚至之前的女生对于工程技术学习的兴趣，包括社会实践(如实习等)，以鼓励年轻女性追随自己的热情、坚持自己的态度，而不要把工科看作是不可能取得成就的领域，以及不值得选择的行业。■

## New Production Hall For Giga Molds

### 新的巨型模具生产厂房启用

Schaufler Tooling inaugurates new production hall to be even better positioned as a pioneer in the segment of gigamolds. It is now possible to manufacture molds with a total weight of over 200 t for casting machines with up to 10,000 t clamping force.

On July 6, 2023, the time had come: In the presence of numerous national and also international guests from the foundry world, Schaufler Tooling inaugurated the new production hall at the company site in Laichingen. The event was officially opened with a speech by CEO Siegfried Heinrich, in which he explained the milestones in the company's development up to becoming one of the world's few suppliers of gigaforms.

"And by giga molds we mean those used in casting machines with clamping forces of at least 6,000 tons," Heinrich said.

This new casting machine dimension is needed for the production of Giga Castings. The aim of giga castings is to replace the body-in-white of a vehicle, which traditionally consists of hundreds of individual parts, with just a few castings and thus achieve significant cost advantages, particularly in vehicle assembly. In the meantime, it has become clear that such giga castings are not a one-off for Tesla, but have become established at Volvo, Toyota, Hyundai and also at other established and new Chinese

为能够成为大型模具生产的引领者，舍弗勒模具集团启用了新的生产厂房，公司现在可以生产重量超过 200 吨的模具，用于锁模力高达 10000 吨的压铸机。

2023 年 7 月 6 日，在来自铸造业的众多国内外嘉宾的见证下，舍弗勒集团在莱钦根的公司为新的生产厂房揭幕。该活动以首席执行官齐格弗里德·海因里希的演讲正式拉开帷幕，他讲述了公司成为世界上为数不多的巨型模具供应商之一的发展历程。

海因里希说：“我们所说的巨型模具是指他们所使用的压铸机的锁模力至少要达到 6000 吨。”

更高的压铸机锁模力是生产大型铸件所必需的。生产大型铸件的目的是用少量铸件取代传统上由数百个单独零部件组成的白车身，从而显著降低成本，尤其是车辆装配方面的成本。同时，显然，这种巨型铸件并不是特斯拉公司独有的，而是已经由沃尔沃、丰田、现代以及其他中国老牌和新兴汽车制造商生产出来了。

新生产厂房的主要设备包括一台载重为 120 吨的起重机和一台能够定位重达 200 吨模具的压力机。此外，该公司还

vehicle manufacturers.

The new production hall, which covers almost 1,000 m<sup>2</sup>, enables Schaufler Tooling to produce molds with a total weight of over 200 t for casting machines with up to 10,000 t clamping force. The main equipment in the new production hall includes a crane with a load capacity of 120 t and a press capable of spotting molds weighing 200 t. In addition, the company has invested in a 5-axis machining center with traverse distances of 6 x 4 meters, which is used for repairs and machining of completely assembled gigamolds. In addition, assembly boxes are available which allow the final assembly of three such large molds to be carried out in parallel.

After Heinrich's speech, the companies Handtmann, Bühler and Tvarit presented their strategies on the subject of Giga Casting in exciting technical presentations and welcomed the fact that Schaufler Tooling, as a premium mold maker, is supporting this new segment. The event was rounded off with a company tour and joint dinner.

Schaufler Tooling is part of the moldmaking group SF Tooling, which also includes Fischer Tool & Die in the USA and Schaufler in China. "This makes us the only die casting moldmaking group that maintains its own regional production sites in the three main markets for die cast parts, especially for giga molds." COO Dr. Joachim Schuster proudly reports. Within SF Tooling, the twentieth Gigaform is currently nearing completion. These have been produced for four different Giga Castings at the three locations of the SF Tooling Group, delivered to three different vehicle manufacturers so far and to a total of five foundry locations.

"The biggest challenge with gigaforms lies in the regulation of the thermal balance. With our now diverse experience in this segment, we are continuously learning and now offer tried-and-tested solutions for optimum cooling," says CEO Heinrich. And COO Dr. Joachim Schuster adds finally: "We are also transferring these findings and optimizations at Gigaformen to smaller die casting molds. In this way, we are making a significant contribution to ensuring that the cost-effectiveness of the die casting process remains guaranteed for existing die castings in the future." ■



购置了横向距离为6x4米的五轴加工中心，用于修理和加工完全组装好的巨型模具，还有可供同时将3个大型模具进行装配的组装箱。

在海因里希的演讲之后，汉特曼、布勒和Tvarit公司在精彩的技术演示过程中介绍了他们关于大型铸件的发展战略，并对舍弗勒集团作为一家高端模具制造商在这一新领域取得的成

绩表示欢迎。

舍弗勒模具公司是舍弗勒集团的一部分，该集团还包括美国的Fischer Tool&Die公司和舍弗勒（中国）公司。首席运营官Joachim Schuster博士自豪地说：“这使我们成为唯一一家在3个主要的压铸市场拥有自己的生产基地的压铸模具制造集团，特别是巨型模具的生产。”目前，舍弗勒公司的第20个大型模具已基本完成。这些模具分别由集团的3个生产基地制造，用于4个大型铸件，目前已交付给3家汽车制造商，总共提供给5个铸造厂。

首席执行官海因里希表示：“制造大型模具的最大挑战在于热平衡的调节。凭借我们在这一领域的丰富经验，通过不断学习，公司现在已经能够提供久经考验的最佳冷却解决方案。”首席运营官Joachim Schuster博士最后补充道：“我们还将大型模具的技术成果和优势应用到较小的压铸模具生产中。因此，我们为确保压铸工艺仍能在未来具备成本效益做出贡献。” ■



## Nemak Set To Expand In Wisconsin

### 尼玛克将扩建威斯康星州压铸工厂

Nemak Wisconsin has received municipal approval to begin construction of a 49,500-sq.-ft. expansion of its manufacturing facility in Sheboygan.

The addition will be located on the north side of the existing facility, with 35,300 sq. ft. dedicated to a diecasting production area with storage. The space will accommodate two 4,500-ton diecasting machines and auxiliary equipment. Construction is expected to be completed by September 2024.

Nemak is a provider of lightweighting solutions for the global automotive industry, specializing in the development and manufacturing of aluminum components for e-mobility, structure and chassis, and ICE powertrain applications. ■

日前，尼玛克已经获得威斯康星州政府的批准，计划新建面积为 49500 平方英尺（约 4598.7 平方米）的生产车间，用于扩充其在美国威斯康星州希博伊根工厂的产能。

新建车间位于工厂的北侧，占地 35300 平方英尺（约 3279.5 平方米），作为压铸生产和仓库使用。新车间将可容纳两台 4500t 的压铸机和周边设备。该项目预计将于 2024 年 9 月完工。

尼玛克是全球汽车行业轻量化解决方案的供应商，专门开发和制造用于电动汽车、汽车结构件、底盘，以及汽车动力总成应用的铝合金部件。■

## Waupaca Foundry Adds Horizontal Molding Line

### 沃帕卡铸造公司新增水平造型线

AFS Corporate Member Waupaca Foundry has expanded production capabilities at Plant 1 located in Waupaca, Wisconsin, adding horizontal molding to existing vertical molding capabilities. Installation on the new line began in February. To mark its new capabilities, the foundry held a “first pour” event on April 18.

“We are making this investment as a direct response to customer demand,” said Waupaca Foundry President, COO, and CEO Mike Nikolai. “We have made strategic capital investments in key areas of production including the use of material handling automation; now we are adapting to customer needs by offering both horizontal and vertical molding.”

The production expansion directly addresses customer concerns about tooling costs for low volume, complicated parts that were previously produced using the vertical molding process.

“Waupaca Foundry has a strong reputation for high-volume production,” said James Newsome, the company’s vice president of sales and marketing. “By adding horizontal molding, our customers have a solution for value-added services to produce low-volume, complicated parts.”

The plant installed a Sinto Horizontal Molding Machine within its existing footprint, the first in operation in the U.S.

Features include:

- High-speed production with a mold rate of 200 molds/hour.

美国铸造协会会员企业沃帕卡铸造公司在现有垂直造型线的基础上增加了水平造型线，扩大其位于威斯康星州沃帕卡的 1 工厂的产能。新造型线于 2 月份开始安装，并于 4 月 18 日举行了“首次浇注”的纪念活动。

沃帕卡铸造公司总裁、首席运营官兼首席执行官迈克·尼古拉表示：“我们在关键的生产环节进行了战略投资，包括材料运输实现自动化；为了适应客户需求，我们既可提供水平造型工艺又可提供垂直造型工艺。”

通过新上水平造型线，可以直接解决客户对使用垂直造型工艺生产小批量复杂零部件的生产成本的担忧。

“沃帕卡铸造公司在大批量生产方面享有盛誉，”公司的销售和营销副总裁詹姆斯·纽瑟姆说，“通过增加水平造型线，我们还可以为客户提供小批量、复杂零部件的增值解决方案。”

公司在其现有厂区内安装了一条新东水平造型线，这是在美国投入运营的第一条此类造型线。其特点包括：

- 高速生产，造型速度为 200 型 / 小时；
- 快速更换模板，换型时间缩短至 18 秒；
- 卓越的砂型强度和精度；
- 砂芯放置自动化；

- Quick pattern changes of 18 seconds within cycle time.
- Excellent mold strength and accuracy.
- Automatic core setting.
- Laser-guided automatic pouring.

The Sinto Horizontal Molding Machine is paired with an ExOne S-Max Pro 3D core printer that allows production of complex core assemblies as a single piece core and creates the ability to produce rapid prototype castings. The new process allows Waupaca Foundry to adapt existing matchplate tooling of equal or smaller size quickly in order to respond to customers' tight deadlines. ■

· 在激光引导下完成自动浇注。

将新东水平造型线与 ExOne 的 S-Max Pro 3D 砂型打印机配合使用，可以将复杂的型芯组件作为单件型芯进行生产，并能够快速生产原型铸件。新的生产线使沃帕卡铸造公司能够快速调整现有砂型的尺寸，满足客户紧迫的交货周期要求。■

## Linamar Building Giga Casting Facility In Canada

### 利纳马集团在加拿大建造大型一体化铸造厂

Linamar is constructing a Giga casting facility in Welland, Ontario, Canada, that's expected to be completed January 2024 and operational in 2025, according to a report by Dave Johnson in the Welland Tribune.

Serving the automotive, agricultural, and industrial sectors, the company will purchase high-press diecasting equipment for the new facility—each weighing in excess of 6,000 tons, a category with just 25–30 machines in use worldwide.

“We'll be able to cast much larger lightweight components,” said CFO Linda Hasenfratz. “With the program we are launching, we're able to take a part that was 72 kilograms down to 42 kilograms. We can take what was 35 different parts and reduce it to only five,” she told the Tribune. ■

据 Dave Johnson 在《威兰论坛报》上的报道，利纳马集团正在加拿大安大略省威兰投建大型铸造厂，预计将于 2024 年 1 月完工，并于 2025 年投入运营。

公司为汽车、农业和工业部门提供铸件，公司将购买锁模力超过 6000 吨的高压压铸设备，目前全球正在运行的仅有 25–30 台此类设备。

公司首席财务官 Linda Hasenfratz 表示：“我们将具备生产大型轻量化铸件的能力。新厂建成后，我们生产的铸件可以从 72 公斤减少到 42 公斤，原先需要 35 个不同的组件将减少到只需要 5 个。” ■

## Ford Meter Box To Construct New Foundry, Add Manufacturing Capacity

### Ford Meter Box 公司建新厂、扩产能

AFS Corporate Member The Ford Meter Box Co. Inc. (Wabash, Indiana) will expand and modernize its foundry operations and increase downstream production capacity. The 125-year-old firm manufactures waterworks components for private and public infrastructure markets. Its production departments encompass foundry, machining, assembly, warehousing, and supporting skilled trades operations.

Ford Meter Box plans to construct a 300,000-sq.-ft. state-of-the-art nonferrous foundry on a 90-acre site in Wabash's

美国铸造协会会员企业 Ford Meter Box 公司（印第安纳州沃巴什）将扩大其铸造业务并使其现代化，提高下游产品的生产能力。这家拥有 125 年历史的公司为私人 and 公共基础设施建设提供自来水管部件。其生产部门包括铸造、机加工、装配、仓储，同时依靠熟练的技术工人。

Ford Meter Box 公司计划在沃巴什东北工业园区的一块 90 英亩（约 364217 m<sup>2</sup>）的土地上建造 30 万平方米的有

northeast industrial park, pending local approvals.

Company President Steve Ford said the expansion will be the largest in its history. “The new facility will complement existing manufacturing operations at the firm’s Manchester Avenue location,” he added. “Parts of our present foundry will remain in production, and parts will be repurposed to better utilize space.” Groundbreaking is anticipated by late summer or early fall.

AFS Corporate Member GK Systems was chosen to be the principal design firm. “Being selected as a partner by Ford Meter Box is a true honor,” said Tom Musschoot, CEO of GK Systems and a third-generation leader with the AFS Corporate Member engineering, planning and construction firm. “Our shared values of family and community drive our businesses. We both strive to uphold the highest standards while delivering quality products, making the opportunity an even greater privilege.”

The company’s multi-year modernization effort represents a \$250- to \$300-million investment in technology, capacity, flexibility, safety, automation, and training across two Wabash campuses. The project is intended to increase the company’s resilience for the long term while addressing waterworks needs arising from an aging U.S. water infrastructure and the construction of single and multi-family housing units. ■

色金属铸造厂，目前正在等待当地政府部门审批。

公司总裁 Steve Ford 表示，此次扩建将是公司历史上规模最大的一次。他补充道：“新工厂将作为公司曼彻斯特大道厂区现有生产业务的补充，工厂的一部分将继续生产运营，另一部分将进行翻新以更好地利用空间。”扩建项目预计将在夏末或初秋启动。美国铸造协会会员企业 GK Systems 当选为主要的设计公司。GK Systems 首席执行官、负责工程、规划和建设的第三代领导者 Tom Musschout 表示：“能够作为 Ford Meter Box 的合作伙伴是一项真正的荣誉。我们拥有的共同的家族和社会价值观推动着公司业务的发展。我们坚持按照最高标准生产，提供优质产品，从而持续扩大我们的优势。”

多年来，公司投资 2.5-3 亿美元对两个沃巴什园区进行了现代化改进，包括技术、产能、灵活性、安全性、自动化和培训等方面。该项目旨在提高该公司的长期弹性，同时解决美国管道基础设施老化问题，以及满足单户和多户住房建设带来的自来水建设需求。 ■

## Sintercast Breaks Four Million Engine Equivalent Milestone

### 欣特卡斯特公司突破 400 万台当量发动机

SinterCast set a series production all-time high of 4.1 million Engine Equivalents in June, surpassing the four million Engine Equivalent milestone for the first time. This followed production of 3.9 million Engine Equivalents in May, marking an end to the variable production that affected the first four months of the year.

Despite production of 3.1 million Engine Equivalents in April, series production for the second quarter finished at 3.7 million Engine Equivalents, establishing a new quarterly record and extending the streak to nine consecutive quarters of year-on-year series production increases. In perspective, second quarter production finished 12% above the volatile first quarter and 6% above full-year 2022.

Sampling Cup volume also improved during the second quarter, finishing at 49,500 units. The second quarter volume represents a 50% increase over first quarter shipments (33,100) and returns to the recent full-year pace of approximately 200,000 Sampling Cups shipped in 2021 and 2022. The company said the second quarter increase indicates customers have largely concluded their efforts to restrict orders and to re-establish minimum stock levels following the normalization of global

欣特卡斯特公司在 6 月份创下了 410 万台当量发动机的历史新高，首次突破了 400 万台当量发动机的里程碑。此前，公司在 5 月份生产了 390 万台当量发动机，标志着今年前 4 个月的产量波动已经结束。

虽然 4 月份的当量发动机产量为 310 万台，但第二季度的系列产量为 370 万台，创下了新的季度记录，保持了连续 9 个季度的增长。客观来看，第二季度的产量比第一季度高出 12%，比 2022 年全年高出 6%。

取样杯的产量在第二季度也有所提高，最终达到 49500 台套。第二季度的出货量比第一季度（33100 台套）增长了 50%，并恢复到 2021-2022 年近 20 万个取样杯的全年出货量的水平。公司表示，第二季度的增长表明，随着全球供应链逐步恢复正常，客户订单减少、库存水平较低的情况已基本结束了。

公司总裁兼首席执行官 Steve Dawson 博士表示：“从 1999 年开始，直到 2015 年，我们用 16 年的时间才达到了

supply chains.

“From the start of our first series production in 1999, we needed 16 years to reach the 2 million Engine Equivalent barrier in 2015,” said Dr. Steve Dawson, president and CEO. “Now, we have doubled our production to four million Engine Equivalents in half the time. With four million accomplished, we now set our sights on five million.” ■

200 万当量发动机的大关。现在，我们用之前一半的时间将产量翻了一番，达到 400 万台当量发动机，而且我们的下一个目标是 500 万台。” ■

## Ka Shui Group Accelerates its Expansion in North America

### 嘉瑞集团加速拓展北美业务

Ka Shui Group, the executive director of China Foundry Association and rotating chairman of the Die Casting Branch, announced that the company had successfully acquired Avery Plastics Consulting Group, Inc, an American company based in California, and its company based in Tijuana Mexican, Global Plastic Solution, in July 2023. The Global Plastic Solutions' plant in Mexico, engaged in plastic production and product assembly. This acquisition is an important step for Ka Shui Group to expand new businesses in the Americas and strengthen its production, transportation, and supply chains in North America in the future.

Ka Shui Group, founded in Hong Kong in 1980, is a leading enterprise on product solutions, notably in magnesium, aluminum and zinc alloy die casting and plastic injection moulding industry. The group has set up a number of production bases in Huizhou, Shenzhen, Suzhou and Wuhu in China, and a sales branch in the United States.

Ka Shui Group provides comprehensive solutions of light alloy die-casting and injection molding for industries such as automobiles, 3C electronics, and furniture, and can provide diversified services from raw material modification applications, product concept design, mold design and manufacturing, precision die-casting and injection molding, CNC machining, surface treatment, testing services to assembly and logistics.

For more information, please visit <https://www.kashui.com/> ■

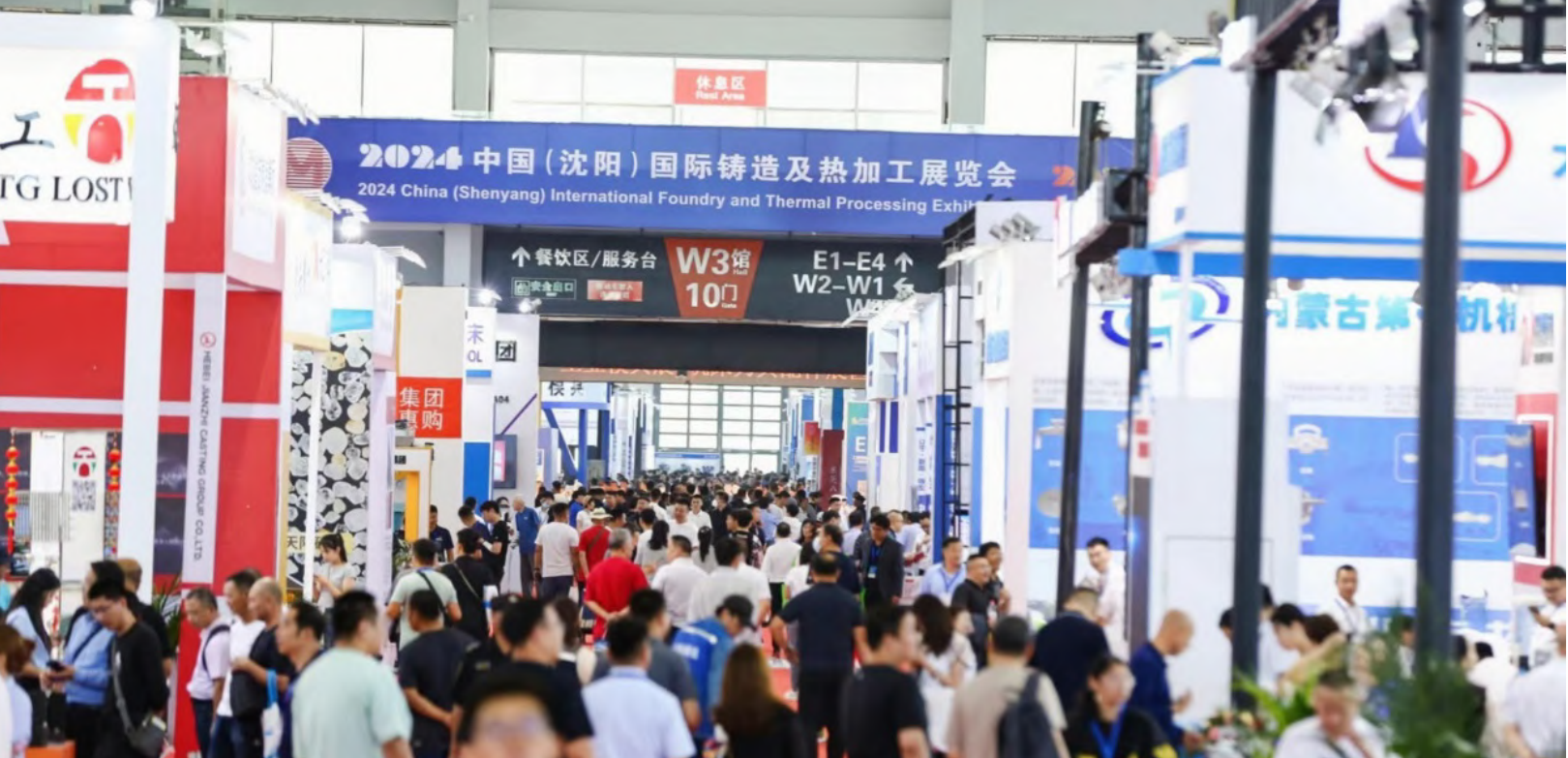
中国铸造协会常务理事、压铸分会轮值理事长单位嘉瑞集团宣布，公司已于 2023 年 7 月成功收购一家位于加利福尼亚州的美国公司 Avery Plastics Consulting Group, Inc, 以及其位于蒂华纳的墨西哥公司 Global Plastic Solution。Global Plastic Solutions 在墨西哥设有工厂，从事塑料生产及产品装配，此次收购为嘉瑞集团未来在美洲拓展新业务，强化北美生产、运输及供应链迈出重要的一步。

嘉瑞集团于 1980 年在香港创立，是提供产品解决方案的领先企业，以镁、铝、锌合金压铸及注塑业为主。嘉瑞在惠州、深圳、苏州和芜湖设立多个生产基地，并于美国设立销售分公司。

嘉瑞为汽车、3C 电子和家具等行业提供全方位的轻合金压铸及注塑解决方案，并可提供从原材料改性应用、产品概念设计、模具设计与制造、精密压铸及注塑、数控加工、表面处理、检测服务到装配和物流等的多元化服务。

更多信息，请访问公司网站：<https://www.kashui.com/> ■





## High-quality Foundry Development Shines at Metal Shenyang 2023

# 2023 沈阳铸造展闪耀铸造业高质量发展之光

With the implementation of the strategy of accelerating the construction of a "manufacturing powerhouse" and carrying the expectation of "high-quality development" in the manufacturing industry, 2023 China (Shenyang) International Foundry and Thermal Processing Exhibition (Metal Shenyang) kicked off jointly with the 21st China International Equipment Manufacturing Expo on September 1.

The total exhibition area is 110000 square meters, with 11 exhibition areas and over 1000 exhibitors. As an important part of the Manufacturing Expo, the Metal Shenyang 2023 focuses on the latest casting technology and application, and nearly 200 exhibitors bring their flagship products, equipment and solutions to the exhibition.

- Dalian Huarui's 55t wind power casting (bearing seat)
- High Quality Machine Tool Casting of Shenyang Machine Tool Yinfeng Foundry, GENERTEC
- The 45t marine diesel engine cylinder casting produced by LK Group's Fuxin Lida Company
- Liquid cooled shell for hybrid electric vehicles cast by Shenyue Foundry

伴随着加快建设“制造强国”战略的实施，承载着行业“高质量发展”的热切期盼，9月1日，2023中国（沈阳）国际铸造及热加工展览会同第二十一届中国国际装备制造业博览会同步拉开帷幕。

本届制博会展览总面积 110000 平方米，共设置 11 大展区，参展商 1000 余家。作为制博会的重要一员，“2023 中国（沈阳）国际铸造及热加工展览会”以铸造及热加工为主题，近 200 家参展企业携拳头产品亮新展彩：

- 大连华锐 55 吨风电铸件（轴承座）
- 通用技术集团沈阳机床银丰铸造高质量机床铸件
- 香港力劲集团阜新力达公司铸造 45 吨船用柴油机缸体铸件
- 神悦铸造的混合动力汽车液冷外壳
- 爱司凯 3D 砂型打印机——风暴 S1800
- 一汽铸锻汽车轻量化核心解决方案



### ·Amsky's Sand 3D Printer - Storm S1800

·The core solution to auto lightweight from FAW Foundry

The exhibitor lineup covered the entire casting industry chain and built an one-stop platform. Nearly 200 leading enterprises in the foundry and related industry have displayed their new products and technologies, including Inner Mongolia First Machinery Group, a leading enterprise in military equipment, Shenyang Yate, a global leader in centrifugal casting and centrifugal equipment, as well as KOCEL Group, Benxi Shentie, Shengquan Group, Tianjin Yuye Silicon Carbide, Yonghong Group, Dalian Yuyang, Lianxin Casting Sand Group, Shengquan Keliyuan, Tianyang New Materials, Dongyi Spectrometer, Qingdao Tede, ASIMCO, GF, FOSECO, Chongqing Changjiang Materials, Longsheng Foundry, etc..

A number of professional areas were highlighted at the exhibition, including high-end castings exhibition area, raw and auxiliary materials, equipment, molds, intelligent manufacturing, 3D printing, art castings, calligraphy and painting exhibition area, as well as industry clusters, showcasing unique features and achievements, for further market expansion and cooperation.

Dozens of concurrent events, such as summit meetings, forums, technical seminars, new product launch, international exchanges, and awards were held, connecting upstream and downstream supply and demand chain, indicating the direction to move towards a new future of high-quality development of the foundry industry.

Foundry Industry Development Summit and 2023 China Automotive Casting Lightweight Forum: The forum invited senior specialists, academic experts, and industry elites from the casting industry, upstream and downstream industries, especially the automotive industry, to gather in Shenyang. It focuses on the hot spots in the new development stage of the automotive industry, new energy and lightweight technologies that have brought significant impacts on the automotive casting industry, and sharing the latest automotive casting technology, planning for medium and long-term development, and discussing about the future development of automobile castings.

此外，兵工装备龙头企业内蒙古一机、全球离心铸管离心设备龙头企业沈阳亚特以及共享智能装备、本溪参铁、圣泉集团、天津宇野碳化硅、永红集团、大连誉洋、联信铸砂集团、圣泉科力源、天阳新材料、东仪光电、青岛泰德、艾斯迪、GF、FOSECO、重庆长江材料、隆盛铸造等近 200 家行业领军企业纷纷携新品重磅登台，参展阵容强大，一站式覆盖铸造全产业链。

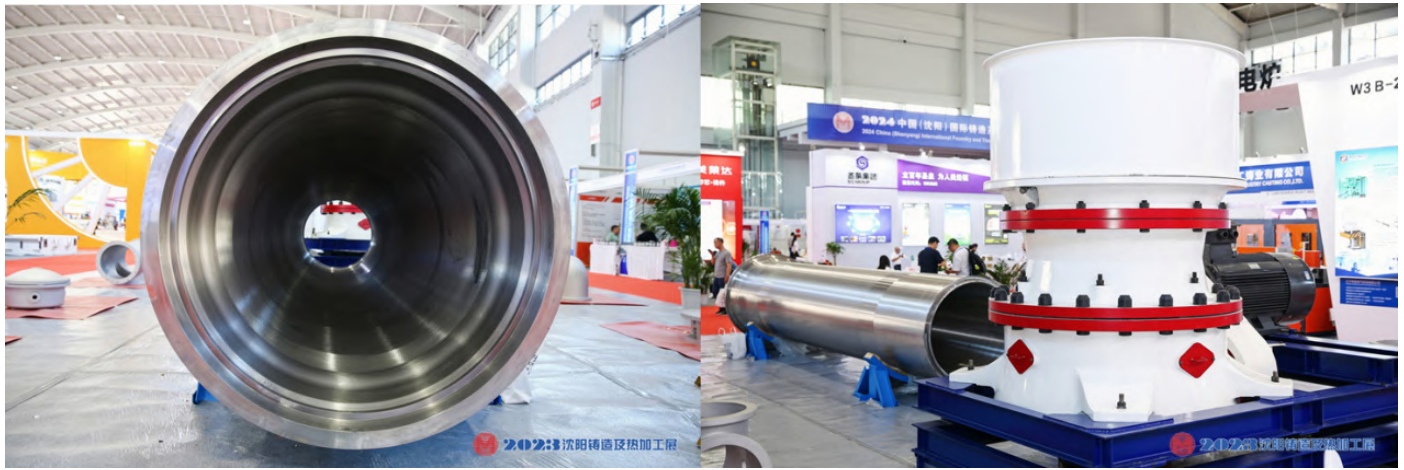
展会上，高端铸件及零部件展区，铸造原辅材料展区，铸造装备、模具、智能制造、3D 打印展区，艺术铸件展区，铸造书画展区等多个专业展区以及国内重点产业集群缤纷亮相，展特色、亮成果、拓市场、促合作。

高峰论坛、技术研讨、新品首发、国际交流、评先颁奖……数十场精彩活动同期举办，链接上下游供需，为行业同仁拨开迷雾，共同迈向铸造行业高质量发展的新未来。

铸造行业发展高峰论坛暨 2023 中国汽车铸件轻量化高峰论坛：会议邀请了铸造行业及上下游特别是汽车界资深专家、业界学术权威、企业精英等 200 余人共聚沈阳，围绕汽车行业进入发展的新阶段，新能源、轻量化给汽车铸造业界带来显著影响等汽车铸造最新热点，共享现今最新汽车铸造技术、共谋中长期汽车铸造发展规划、共话未来汽车铸造发展大业。

一汽铸造有限公司产品技术部高级主任师卢宝胜作《薄壁气缸体铸件的开发》报告，介绍了采用 3D 打印砂芯，组芯造型工艺生产薄壁气缸体（壁厚 2.8mm）的过程，探讨了其中的关键技术参数对质量的影响。3D 打印砂芯工艺灵活性大，尺寸精度高，在产品开发和批量生产中，将得到越来越多的应用。

辽宁省铸锻行业协会常务副会长兼秘书长、东北大学教



Lu Baosheng, Senior Director of the Product Technology Department of FAW Foundry, made a report on the development of thin-walled cylinder block castings. He introduced the process of producing thin-walled cylinder blocks (wall thickness 2.8mm) using 3D printed sand cores and core assembly molding technology, and explored the impact of key technical parameters on quality. The 3D printing sand core process has great flexibility and high dimensional accuracy, and will be increasingly applied in product development and mass production.

Liu Yue, Executive Vice President and Secretary General of Liaoning Casting and Forging Industry Association, and Professor of Northeastern University, presented a report on the "Current Situation and Future Development of Foundry Industry in Northeast China". The report summarizes the development process, casting characteristics, advantages of raw and auxiliary materials, and current situation of talent cultivation for the industry.

Kan Xingyu, Executive Director of Liaoning Huade Technology Co., Ltd., presented a report on "Quality Management of Components in German Automotive Supply

授刘越带来《东北铸造产业现状及未来发展》报告。报告总结了我国“三省一区”铸造行业产业发展历程、铸件产品特点、原辅材料优势及铸造专业人才培养现状，提出“三省一区”铸造行业存在主要问题和今后发展方向。

辽宁华德科技有限公司执行董事阚兴宇作《德国汽车供应链-主机厂零部件质量管理浅解》报告。随着中国汽车产业，尤其是新能源汽车产业的快速发展，汽车供应链的零部件供应商质量管理体系也需要同步快速提升。阚兴宇在报告中就德国汽车零部件质量管理 QMT 的主要职能和工作内容作了讲解。

亚琛工业大学 Konrad Weiß 博士讲解《汽车铸件轻量化方案》报告。报告主要从设计、研发、制造业三者的联系和发展，结合具体案例进行了详细阐述。

深圳智创国际会展有限公司总经理、原西门子数控中国区业务总经理许政顺带来《数字化孪生技术引领金属切削机



Chain - Main Engine Factory". With the rapid development of China's automotive industry, especially the new energy vehicle industry, the quality management system of component suppliers in the automotive supply chain also needs to be rapidly improved. Mr. Kan explained the main functions and contents of QMT for quality management of automotive parts in Germany in the report.

Dr. Konrad Wei ß from Aachen University of Technology, explains the "Lightweight Solutions for Automotive Castings" in his report. The report mainly elaborates on the connection and development of design, research and development, and manufacturing, through specific cases.

Xu Zhengshun, General Manager of Shenzhen Zhichuang International Exhibition Co., Ltd. and former General Manager of Siemens CNC China Business, brought a report titled "Digital Twin Technology Leading the Development and Enlightenment of Metal Cutting Machine Tools". The report analyzes the application of digital twin technology in the design, production, and use of advanced CNC machine tools, and discusses about the future development characteristics and inspiration of intelligent manufacturing of machine tools.

Xue Yueteng, Manager of Non-ferrous Products, Vesuvius Foundry Technology (Jiangsu) Co., Ltd., presented a report on "Achieving grain refinement and improving the performance of aluminum alloy castings through new fluxes".

Zhao Yang, Application Manager of Magma (Suzhou) presented a report on "Mold Temperature Analysis of Large Integrated Die Castings Based on MAGMASOFT Simulation Analysis".

Gao Guoping, General Manager of Shenyang Hongyu Technology Co., Ltd. and Distinguished Professor of Northeastern University, shared the report on "Practice of Digital Transformation and Industrial Internet Empowering the Transformation of Casting and Die Casting Enterprises".

Li Wenjun, Chairman of Dalian Yuyang Industrial Intelligence Co., Ltd., made a report on "Automatic Plan of Flexible Cleaning and Polishing for the Mixed Line Production of Automotive Castings".

Cao Changmao, Secretary of the Board of Directors, Fujian Shenyue Casting Co., Ltd., delivered a report on the "Electric Drive Integrated Casting and Lost Foam Mold Solution".

The 2023 Metal Shenyang exhibition once again proves the vitality of the old industrial base, the innovation of enterprises, and the cohesion of the exhibition platform. Thank you again to all partners, exhibitors, and foundry industry colleagues who have attended the exhibition. Let's cast a brilliant future together. Looking forward to meeting you again in September 2024, Shenyang! ■

床的发展及启示》报告，报告通过数字孪生在先进数控机床设计、生产、使用中的应用技术思路分析，看机床智能制造未来的发展特点及启示。

维苏威铸造科技（江苏）有限公司中国区有色产品经理薛跃腾作《通过新型熔剂实现晶粒细化并提升铝合金铸件性能》报告。

迈格码（苏州）软件科技有限公司应用经理赵阳带来《基于MAGMASOFT模拟分析下的大型一体压铸件的模具温度分析》报告。

沈阳鸿宇科技有限公司总经理、东北大学特聘教授高国平分享《数字化转型与工业互联网赋能铸管压铸企业转型的实践》报告。

大连誉洋工业智能有限公司董事长李文钧作《汽车铸件混线生产柔性清理打磨自动线方案》。

福建省神悦铸造股份有限公司董事会秘书曹昌茂作《电驱动一体化铸造和消失模解决方案》报告。

本届展会用盛况再次证明了老工业基地铸造产业旺盛的生命力、企业的创新力以及展会平台的凝聚力。再次感谢所有合作伙伴、参展商以及莅临和关注展会的铸造业同仁们，初心不忘，铸造辉煌，2024年9月沈阳再相见！ ■





# Turning Sand into Gold-A Strong Economic Engine of Zhangwu

## 彰武点沙成金——沙成为县域经济强引擎



On July 12, the 6th Conference on Foundry Industry's Safety, Environmental Protection and Energy Conservation and the 5th Conference of China (Zhangwu) Silica Sand for Foundry Industry's High-quality Development were held in Zhangwu County, Fuxin City, Liaoning Province in Northeast China. Nearly 200 enterprises took part in the conference, where the sand that can be seen everywhere became the focus.

Zhangwu, located in the south of Horqin Sandy Land, is known as the "sand nest" and "wind gap" in Liaoning Province. In recent years, Zhangwu has turned sand into gold, and turned the "waste sand" into a precious resource for the local economic development.

Ms. Dai Chunwei, deputy director of the Bureau of Industry and Information Technology of Zhangwu County, said that Zhangwu silica sand has the reputation of "fine grain sand", with a natural rounded grain shape and uniform particle size. It can be used in industries of casting, oil, glass, construction, chemical, aerospace, and is listed as the main sand supply base by BMW, Shanghai, Weichai, PetroChina, Sinopec and other enterprises. The annual production of silica sand can reach 3 million tons, accounting for more than 10% of foundry sand production in China. Zhangwu is a

7月12日，第六届全国铸造行业安全环保节能工作会议暨第五届中国（彰武）铸造硅砂产业高质量发展会议在阜新市彰武县召开，吸引全国各地近200家企业参会。在这次盛会上，平时随处可见的沙子成了主角。

彰武位于科尔沁沙地南部，是辽宁省有名的“沙窝子”和“风口”。近年来，彰武人变废为宝，点沙成金，把令人谈之色变的沙子变成县域经济发展的宝贵资源。

彰武县工业和信息化局副局长戴春巍说，彰武硅砂有“沙中细粮”美誉，具有天然的滚圆粒型和均匀的粒度，可应用于铸造、石油、玻璃、建筑、化工、航空航天等领域，被宝马、上柴、潍柴、中石油、中石化等企业列为主要供砂基地。年产硅砂300万吨，占中国铸造用砂产量的10%以上，是著名的“中国铸造用砂产业基地”。

彰武硅砂不光产量大，含金量也越来越高。高新技术企业达到13户，专精特新中小企业6户，省级绿色工厂2个，

well-known "China Foundry Sand Industry Base".

Silica sand in Zhangwu is not only leading in quantity, but also in quality. There are 13 high-tech enterprises, 6 specialized and innovative SMEs, 2 provincial-level green factories, 5 provincial-level technological innovation centers, 2 gazelle enterprises, 9 eagle enterprises, and over 100 invention patents and utility models.

The booth of Lianxin Foundry Sand Group is full of technology. The Customer manager Mr. Zhang Jian said, "in recent years, Lianxin has continuously injected technological factors into small grains of sand, achieving the legend of turning sand into gold. High tech new products have been successfully developed, such as molten ceramic sand and 3D printing sand, although they look the same with ordinary sand, but their prices are hundreds times higher. The most expensive one can be sold at over RMB5000 per ton.

At the booth of Zhangwu Hengyuan Casting Materials Company, there are 6 kinds of sand products, with different colors. Ms. Wang Qian, the regional marketing manager, explained that due to different additives and processes, the price can be increased from several hundred to thousands.

Since the first China (Zhangwu) Foundry Silica Sand Industry Development Conference was held, the Zhangwu silica sand industry has grown from small to large, from point to chain, and from weak to strong, forming three major sectors: deep processing of silica sand, equipment manufacturing and supporting, and high-end building materials. The number of upstream and downstream enterprises related with silica sand has expanded to more than 100. Among them, Zhangwu Yonghong Machinery Manufacturing Co., Ltd. holds 13 invention patents and 14 utility models, leading the industry in vertical molding and shot blasting machines. With the new addition of intelligent three-dimensional storage system, the speed of mold handling has been significantly improved, and intelligent logistics has been achieved.

Based on its resource advantages, Zhangwu will adhere to the development concept of "differentiated competition", continue to expand the sand industry, and embark on an integrated development path of silica sand and casting industry with Zhangwu characteristics, making small grains of sand a powerful engine for its economic development. ■

Source: Liaoning Daily

省级技术创新中心 5 个，瞪羚企业 2 户，雏鹰企业 9 户，发明专利、实用新型 100 多项。

在联信铸造集团展台前，科技范儿十足。客户经理张健说，近年来，联信不断把科技因子注入小小一粒沙中，成就点沙成金的传奇。熔融陶瓷砂、3D 打印砂等高科技新品，虽然看上去和普通烘干砂没什么两样，价格却相差数百倍，最贵的每吨卖到 5000 余元。

彰武恒源铸造材料有限公司展台前摆放着 6 款产品，颜色有黑有黄，不尽相同。市场开发部区域经理王倩解释说，这是由于添加了不同的辅料，施加了不同的工艺，售价也从上百元一下子提高到上千元。

自第一届中国（彰武）铸造硅砂产业发展会议举办以来，彰武硅砂产业从小到大、从点到链、从弱到强，形成硅砂深加工、装备制造及配套、高端建材三大板块，以硅砂牵动的上下游企业扩增至 100 余户。彰武永红机械制造有限公司手握发明专利 13 项、实用新型 14 项，垂直分型造型机、抛丸清理机等产品业内领先。今年，智能立体库全新启用后，大幅提升了模具摆放、运输速度，实现了智慧物流。

彰武将立足自身资源优势，坚持“差异化竞争”理念，持续做大砂文章，走出一条具有彰武特色的硅砂及铸造产业融合发展之路，让小小一粒沙成为县域经济发展的强大引擎。■

来源：辽宁日报



# Status Of The Indian Foundry Industry

## 对话印度铸造——印度铸造业现状

Subodh Panchal

Past President, IIF & Chairman, International Relation Committee (IIF)

Vinit Jain

President, IIF (2022-23)

速波·潘查尔先生 印度铸造协会前任会长兼国际关系委员会主席

威尼特·贾恩先生 印度铸造协会会长

### An Overview

·India is the 2nd largest producer of castings in the world with production of 12.44 Million MT P.A. (2021-22).

·Total No. of units approx. 5000

·Annual turnover – USD 20.0 Billion approx

·The entire engineering manufacturing & engineering exports use metal castings as key inputs & therefore plays a vital role for the entire engineering manufacturing & exports. It is possible to achieve the USD 1.0 Trillion target in manufacturing by 2025 as envisaged by the Govt. on India only with the sustainable corresponding growth of the foundry sector.

·Indian Foundry Industry is well poised to take advantage of the global opportunities and is well poised to becoming the best cast source destination in global trade.

### ADVANTAGE

Growing demand for niche value added castings - aluminum castings and specialty alloys for Electric Vehicles. Increasing demand for high value, high quality castings for Aerospace, Aviation, Defence, Electric Vehicles etc.

Govt.'s impetus on building capabilities in the above mentioned sectors has opened up opportunities for the foundry industry.

India's domestic demand, demographics and government programmes like PLI Schemes encouraging manufacturing, put it in a unique advantageous position.

Consistent supply of cast components to these focus sectors important to achieve the projected growth

Technological growth and capacity building of the foundry sector becomes eminent as the foundry sector can play an integral role in steering India to a USD 5.0 Trillion economy

Govt. of India is focusing on indigenization of defence production, development of Railway & highway infrastructure. With high impetus of these niche sectors, requirement of castings will also grow multifold in the coming years with requirement of precision cast components to match safety-critical requirements of these sectors.

### 概况

·印度是世界第二大铸件生产国，2021-2022年产量为1244万吨

·铸件生产商单位总数为约五千家

·年营业额约200亿美元

·整个工程制造和工程出口过程中都大量使用金属铸件作为关键投入，因此铸件在整个工程制造与工程出口中发挥着至关重要的作用。只有确保铸造业实现可持续的相应增长，才能实现印度政府提出的2025年制造业产出达到1万亿美元的目标。

·印度铸造业准备充分利用全球机遇，并已准备好成为全球贸易中最好的铸件产地。

### 优势

细分市场中高附加值的铸件需求不断增长——电动汽车用的铝铸件和特种合金。以及在航空航天、国防、电动汽车等领域对高价值、高质量铸件的需求不断增加。

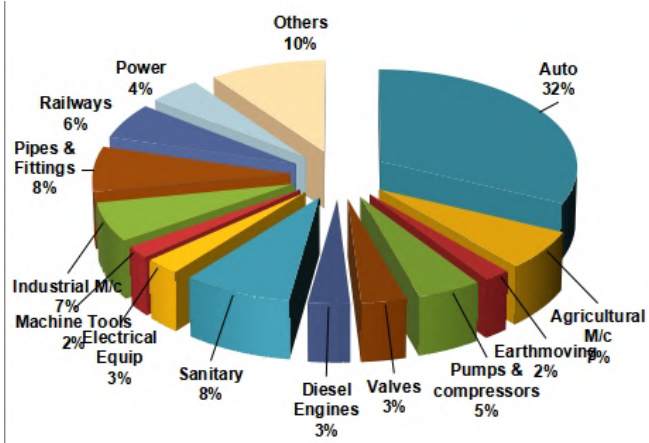
政府对上述领域生产建设的推动，为铸造业打开了机遇。

印度的国内需求、人口基数和政府鼓励制造业发展的各项政策使其具有独特的优势。

保持向这些重点行业持续供应铸件，对实现预期增长尤为重要。

铸造行业的技术增长和体量建设变得格外重要，因为印度的铸造行业可以实现5万亿美元的产值，在经济建设方面的作用不可或缺。

印度政府十分重视国防产业的本土化以及铁路和公路等基础设施的发展。在这些利基产业的大力推动下，未来几年对铸件的需求也将成倍增长，特别是对精密铸件的需求将满足这些重视安全要素的行业需求。



Indian foundry industry has the volumes and quality to support the growing global demand for foundry products.

Indian foundry industry is producing high value, high tech foundry products. Industry also is diversifying into new products, new materials to make light weight components using Carbon alloys, aluminum etc. for use in Electric Vehicles etc.

**Foundry industry as a “Mother Industry” provides cast components to the following key sectors:**

- Automotive
- Electric Vehicles
- Railways
- Defence
- Aerospace
- Capital Goods
- Steel
- Machine Tools
- Renewable Energy
- Power Generation & Transmission
- Textile
- Sanitary
- Electrical equipment etc.
- Cement Machinery
- Agriculture Machinery
- Construction Equipment
- Pumps & Valves

Foundry Sector registered growth of approx 10% Y.O.Y. in casting production from 2020-21 to 2021-22

Projected growth for 2022-23 approx. 10-12%, inclined to touch 13.5 Million Ton Mark

**Casting Export Data**

Foundry Sector registered growth of 23.5% Y.O.Y. in exports from 2020-21 to 2021-22

Projected growth for 2022-23 approx. 12-15%, inclined to touch USD 4.0 Billion Mark

Casting export is key contributor to overall Engineering export with additional export of Approx USD 3.0 Billion of value added components

Trends from Consumer Sectors- AUTO

印度铸造业的数量和质量足以支持全球范围内对铸造产品日益增长的需求。

印度铸造业正在生产高附加值、高技术含量的铸造产品。工业也在多样化，生产新产品、新材料，以制造轻量化功能部件，特别是使用碳合金、铝等材料用于电动汽车的生产。

**铸造业作为“母工业”，为以下关键行业提供铸件：**

- 汽车 · 电动汽车 · 铁路 · 国防 · 航空航天
- 资本货物 · 钢 · 机床 · 可再生资源
- 发电和输电 · 纺织 · 卫生 · 电气设备
- 水泥机械 · 农业机械 · 建筑设备 · 泵阀

在 2020-2021 年期间和 2021-2022 年期间，铸件产量年同比增长约 10%

2022-2023 年的预计增长率约为 10-12%，将接近 1350 万吨大关

**铸件出口数据（单位：百万美元）**

· 2020-2021 年和 2021-2022 年期间，印度铸造业出口同比增长 23.5%

· 2022-2023 年的预计增长率约为 12-15%，将接近 40 亿美元大关

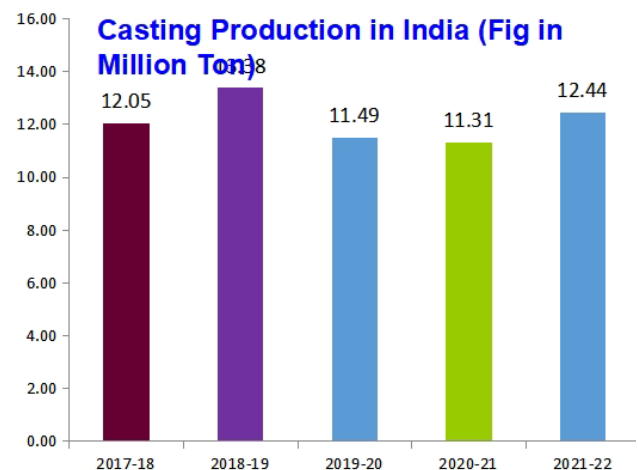
· 铸件出口是整体工程出口的主要贡献者，构成了约 30 亿美元的额外出口值

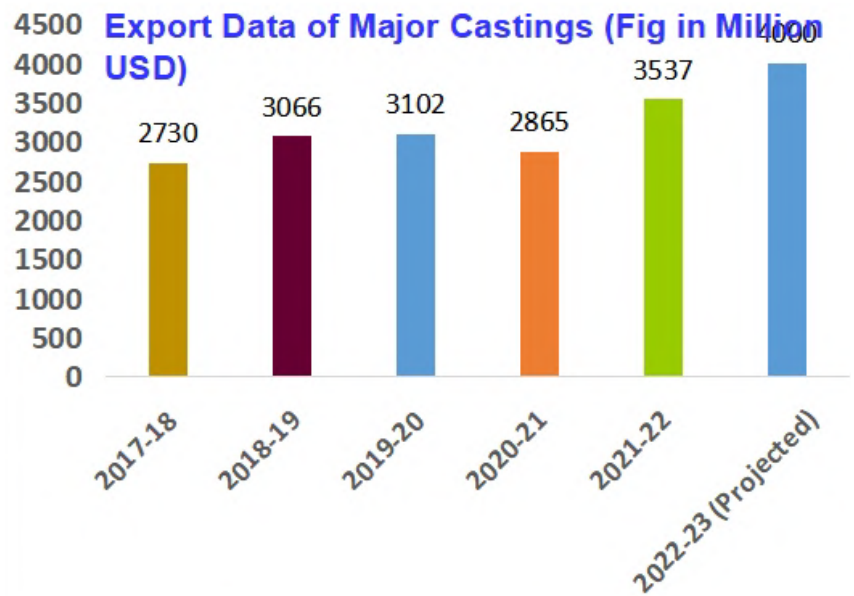
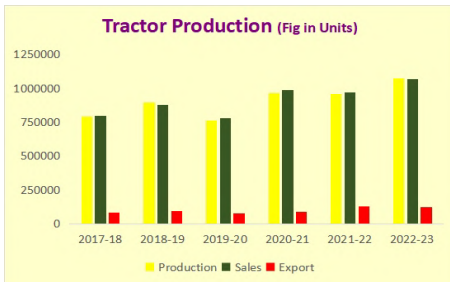
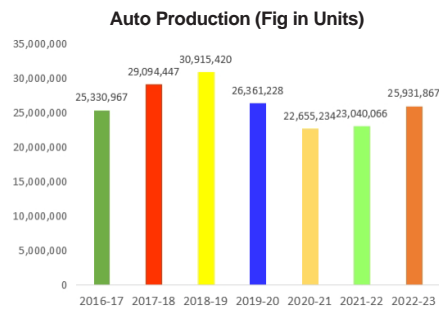
- 消费行业趋势 - 汽车
- 汽车产量（单位：数字）
- 过去两年中连续出现正向增长
- 乘用车、商用车、三轮车和两轮车等所有细分市场都出现了增长

· 消费行业趋势 - 拖拉机

· 2022-2023 年期间实现正向增长

2022-2023 年期间，拖拉机产量增长了约 12%，销售





Positive growth registered consecutively in the last 2 years  
Growth in all segments i.e. passenger vehicles, commercial vehicles, three wheelers and two wheelers

Trends from Consumer Sectors- TRACTOR Positive growth registered in the year 2022-23

In the year 2022-23, production of tractors increased by approx 12% and sales increased by approx. 10%

### Outlook/ Targets (next 5 years)

Industry needs to grow 3-fold producing 25-30 Mn Tons/PA in next 5 years to support “Make in India” & “Aatmanirbhar Bharat” goals

The Indian foundry industry is estimated to garner around USD 3.0 Billion of investment in next 5 years to cater to demand for castings of 30 million metric tons

Exports - Current USD 3.53 Bn. Potential to grow to USD 7-8 Bn in next 5 years by improved quality, productivity, value addition, cost competitiveness.

Potential to generate additional 3.0 Million jobs in next 5 years

Productivity to increase from 20 Ton/Man/Year to 50 Ton/Man/Year

Value addition to increase from 20% on an average to 50%

### Opportunities for Growth

- Rapidly changing technologies in Auto sector, production of Electric vehicles requiring new materials and components

- Capital Goods, Power Generation, Cement and Textile Machinery

- Opening up of Defence/Aero & Space Sectors to Private sector

- Modernization of the Railways-High Speed Trains

- Government’s priority-infrastructure development

- Several Multinational Companies are looking to India to relocate their manufacturing units

- Expanding export markets owing to global opportunities ■

额增长了约 10%

### 未来五年的目标与展望

印度铸造业需要在未来 5 年内将产量提高 3 倍，达到年产 2500 万至 3000 万吨，以支持“印度制造”和“自力更生的印度 (Aatmanirbhar Bharat)”计划。

印度铸造业希望在未来 5 年将获得约 30 亿美元的投资，以满足 3000 万吨铸件的需求。

出口 - 目前出口额为 35.3 亿美元。预期通过提升质量、生产力、附加值和成本竞争力，在未来 5 年争取增长至 70-80 亿美元。

预计未来 5 年新增 300 万个就业岗位。

实现将人均生产率从 20 吨 / 人 / 年提高到 50 吨 / 人 / 年的目标。

实现附加值比例从平均 20% 增加到 50%。

### 需要关注的增长点

- 汽车行业技术发展日新月异，电动汽车生产需要新材料和新部件。

- 资本货物、发电、水泥和纺织机械。

- 国防 / 航空航天领域向私营经济开放。

- 铁路和高速列车的现代化发展。

- 政府优先开展基础设施建设。

- 众多跨国公司正逐渐将其制造工厂迁往印度。

- 抓住全球机遇，扩大出口市场。 ■



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# Growth of 5-7% Forecast for Global Industrial Robot Market

## 未来 5 年全球工业机器人市场增长 5-7%

By: Bharat Gite, CEO & MD, Taural India

作者: 印度 Taural 公司首席执行官兼总经理 Bharat Gite

- Industrial robot revenues grew by 14.9% in 2022.
- Long-term demand for industrial robots to be fueled by the electric vehicle manufacturing sector.
- Average selling prices of industrial robots will decrease by around 3% annually over the next 5 years.

Global economic volatility and supply chain disruptions are having a huge impact on the market for industrial robots, which has led to project delays and decreased spending on automation projects. Despite this, long-term projections remain steady, with electric vehicle (EV) manufacturing and new energy related applications fueling global demand for industrial robots and growth of 5-7% forecast for the sector out to 2027.

Interact Analysis has recently published updated forecasts for the industrial robot market, and they mark the most significant revisions compared to the 2022 version of the report. From 2023 onwards, the market intelligence specialist predicts investment confidence will continue to be low in the short term, causing end-users to delay large capital investments on industrial robotics projects. In the long term, demand from new EV manufacturing lines and from service sectors such as intra-logistics will further fuel the market, resulting in an average growth rate of 5-7% which is much higher than the pre-covid period.

Following a slow 2020 due to the pandemic, the industrial robot market enjoyed substantial growth in 2021, witnessing a year-on-year increase of 34.9%. The market cooled slightly in 2022 but still expanded, registering 11.9% unit shipment and 14.9% revenue growth. The pandemic helped to fuel demand for the robotics industry as companies turn to automation as a way of alleviating labor shortages. Many companies are now investing in industrial automation in order to add stability to their workforce should future crises occur.

In 2022, China accounted for a 39.1% revenue share and 55.4% shipment share of the global industrial robot market. Interact Analysis forecasts that the Chinese market will account for over 60% of industrial robot unit shipments from 2024. The EMEA market for industrial robots was the second largest in the world accounting for 14.8% of total shipments in 2022. The

- 2022 年工业机器人行业收入增长 14.9%。
- 电动汽车制造业将推动工业机器人的长期增长。
- 未来 5 年，工业机器人的平均售价将每年下降约 3%。

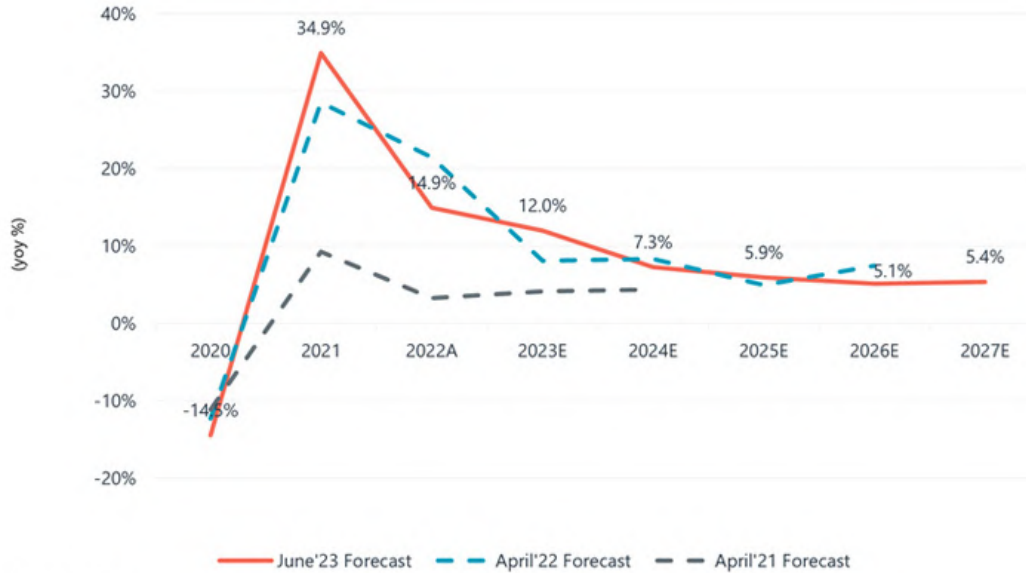
全球经济波动和供应链中断对工业机器人市场产生了巨大影响，例如项目延期、自动化项目投资减少等。尽管如此，预测工业机器人市场长期将保持稳定，尤其是电动汽车和新能源领域的相关应用使全球工业机器人的需求持续增长，预计到 2027 年，工业机器人市场规模将增长 5-7%。

Interact Analysis 最近发布了关于工业机器人市场的最新预测，在 2022 年版基础上做了重要修订。据预测，从 2023 年起，短期内投资信心将持续低迷，导致最终用户推迟对工业机器人的大规模投资。但从长期来看，电动汽车市场和企业内部物流等领域不断增长的需求将进一步推动工业机器人市场的增长，预测平均增长率为 5-7%，将远高于新冠疫情前的水平。

2020 年，工业机器人市场因疫情增速放缓之后，2021 年呈现大幅增长，同比增长 34.9%。2022 年增速略有回落，但销售量仍增长 11.9%，营收增长 14.9%。由于疫情原因，企业不断向自动化转型，以缓解劳动力短缺的问题，从而刺激了机器人行业的需求增长。很多公司现在都加大了工业自动化投资，以便为未来突发危机时的员工队伍增加稳定性。

2022 年，中国占全球工业机器人市场营收的 39.1%，销售量占比为 55.4%。据 Interact Analysis 预测，从 2024 年起，中国市场将占工业机器人总销量的 60% 以上。欧洲、中东和非洲是世界第二大工业机器人市场，2022 年销量占全球的 14.8%。俄乌冲突导致能源价格上涨，削弱了工商界信心，可能会影响就业和投资决策，因此仍然是

## Forecast Variance of Industrial Robots Market - Revenue



Source: Interact Analysis

© Interact Analysis 2023

Russia-Ukraine conflict is still a significant threat to Eurozone growth prospects not only because of energy price increases but also because it pushes down business confidence, which could affect employment and investment decisions. The American market for industrial robots was estimated to be worth \$2.8Bn in 2022, accounting for 19.8% of global revenues, with 55,268 units shipped.

Maya Xiao, Research Manager at Interact Analysis comments, “Interestingly, in 2022 the average selling price of industrial robots increased for the first time in the last 10 years, as a result of raw material cost, component shortages and supply chain disruptions. Despite this, we forecast that average prices will decrease over the next 5 years.”

“The increased demand for industrial robots from the material handling and welding sectors has had, and will continue to have, an impact on average selling prices. As a result of this, demand for heavy-duty models has once again increased, which has altered the payload distribution of the robot market. However, overall, we expect to see a 3% annual decline in prices over the next 5 years.”

This report provides insight and analysis into the industrial robot market. The research covers, among others, market size and forecast data for industrial robots with detailed segmentations both revenue and shipment terms, as well as 5-year forecasts out to 2027. ■

欧元区增长的重大威胁。据预测，2022年美国工业机器人市场产值约28亿美元，占全球市场的19.8%，销量为55268台。

Interact Analysis的经理Maya Xiao说：“有趣的是，由于原材料成本上涨、零部件短缺和供应链中断，2022年工业机器人的平均售价在过去10年中首次上涨。但是，我们预测未来5年其平均售价将下降。”

“材料运输和焊接行业对工业机器人需求的增加已经并将继续对工业机器人的平均价格产生影响。因此，重型机器人的需求继续扩大，已经改变了机器人的市场分布。总体而言，我们预计未来5年工业机器人的价格每年将下降3%。”

本报告为工业机器人市场提供了深入的见解和分析，涵盖了工业机器人的市场规模和预测数据，包括细分领域的销售收入和产量，以及做了近5年（到2027年）的市场预测。■



# Why is Aluminium Becoming an Indisputable Choice for the EV Sector?

## 铝何以成为电动汽车行业无可争议的选择？

We are currently in the midst of an immediate and accelerating decarbonisation process, which demands our undivided attention. Across the world, there is a renewed emphasis on technological innovations and production protocols that reduce carbon footprints. The rise of electric vehicles is one such surefire innovation that has begun delivering great returns as far as sustainability is concerned, and its yield will only improve henceforth. To truly actualize the next phase of the green revolution, we must reassess our material preferences within the Electric Vehicle (EV) industry. Aluminium, recognized for its eco-friendly attributes, could be the game-changer we need. Adopting aluminium in EV production could yield substantial, enduring benefits, firmly placing aluminium at the forefront of our sustainable future.

### The coming of age of aluminium

Aluminum's utility in the modern age becomes abundantly clear from the exponential rise in its use in the construction, electrification and transportation sectors. The global aluminium market is poised to grow at a healthy pace of 6.1% CAGR to \$ 255.91 billion by 2029.

There are many benefits that Aluminium brings to the table. Aluminium dwarfs other metals by a mile when it comes to resisting corrosion. The metal is self-healing, which is to say that it forms a protective oxide barrier when cracked, dented or deformed. It has better in-service dent resistance and can be used without paint or coatings. With aluminium, manufacturers beget greater durability from their output, leading to higher cost savings, lesser maintenance burden and longevity.

### The Aluminium Advantage: Fueling the Future of EVs

In 2022, the global steel industry topped an impressive USD 1.27 trillion, solidifying its dominance within the world of metals. However, Aluminium is set to disrupt the status quo. With its numerous advantages, it is steadily carving out its niche in sectors traditionally dominated by steel, including defence, energy, and infrastructure.

As we cast our minds across industries, the EV market emerges as a pivotal area of disruption. Notably, aluminium

目前，全球正处于加速减少碳排放的进程中，需要我们全力以赴。在世界各地，人们更加重视有利于减碳的技术和生产方式。电动汽车的创新业已成熟，就可持续性而言，已经产生巨大的回报。今后，电动汽车的产量势必会继续提高。为了真正推进这一“绿色革命”，我们必须重新评估电动汽车的材料选择。铝以其环保特性而闻名，可能会改变行业的竞争趋势。在电动汽车生产中采用铝可以产生巨大而持久的效益，因此，应该将铝置于可持续未来发展的前沿。

### 铝时代即将到来

铝在建筑、电气化和运输行业的使用量呈指数级增长，由此可见，铝的使用已变得非常重要。到 2029 年，全球铝市场将以 6.1% 的复合年增长率而稳步增长，达到 2559.1 亿美元。

铝有很多优点。在耐腐蚀方面，铝使其他金属相形见绌。也就是说，当出现破裂、凹陷或变形时，铝会形成保护性的氧化膜，因此铝具有自我修复功能。铝具有更好的抗凹陷性，可以在没有油漆或涂层的情况下使用。铝产品更具耐用性，从而有助于节省企业成本，减少维护负担和维修时长。

### 铝的优势：助力电动汽车的未来

2022 年，全球钢铁行业营收 1.27 万亿美元，取得了巨大突破，巩固了其在金属领域的主导地位。然而，铝将打破现状。凭借其诸多优势，铝正在钢铁占据主导的国防、能源和基础设施等传统行业稳步开拓自己的市场。

从各行业来看，电动汽车市场将成为一个关键的突破领域。值得注意的是，铝极大地提高了纯电动汽车的续航里程，并将有助于减轻汽车重量。在确保乘客安全方面，铝胜过钢。在发生碰撞时，每公斤铝吸收的能量比钢多，而且由于其卓越的碰撞挤压性能，可以承受多次撞击，如侧翻。

此外，铝表现出优异的导热性，重量轻且耐用，非常适

vastly improves the driving range of BEVs and contributes majorly to mass reduction. When it comes to ensuring the safety of passengers, aluminium trumps steel. In the event of a crash, aluminium absorbs more energy per kilogram than steel and, with its superior crash-crush properties, can withstand multiple blows, such as a rollover.

Additionally, electric vehicles (EVs) perform better with metals that exhibit excellent thermal conductivity, are lightweight and durable, and are well-suited for complex geometric and functional integrations, as well as battery maintenance. All these criteria are naturally fulfilled by aluminium.

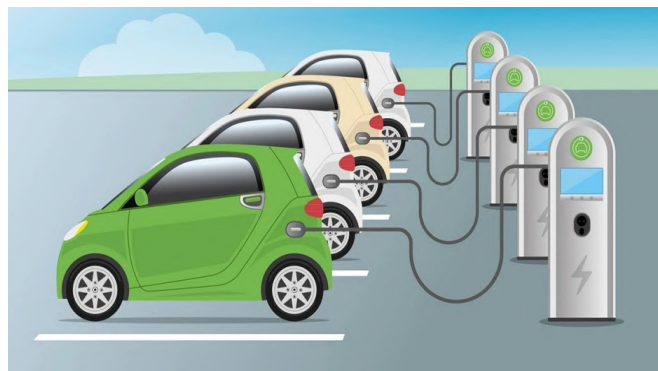
Tracing the evolution of Aluminium in the automotive industry, one can't help but notice its meteoric rise. The use of aluminium in cars has been leaping upwards since the 1970s, when close to 35 kgs of aluminium went into the making of a car, as opposed to the modern-day scenario, where a car has almost 150 kgs of aluminium in it. As mentioned by Frost & Sullivan, the average aluminium content in vehicles is set to surge almost one and a half times to 250 kilograms over the next five years.

There is also a fascinating shift in preferences of the EV manufacturing industry at large. Aluminium castings have become the go-to choice for the EV industry. Aluminium sand casting shines in producing complex parts in commercial EVs. The mega-casting process offers significant advantages, including weight reduction, crucial for enhancing long-range battery technology. As the demand for EVs rises, aluminium castings prove indispensable, delivering durability, complexity, and weight reduction to drive electric mobility forward. The potential surge can be seen from how Volvo has pledged around \$1.2 billion in a brand new manufacturing unit in Sweden, which is singularly dedicated to manufacturing electric cars.

Aluminum's influence in the EV revolution is expansive, reaching beyond the vehicles themselves. The silver metal is playing a significant role in the development of the entire EV ecosystem, including the critical charging infrastructure. Its characteristics make it an ideal choice for manufacturing charging connectors, heat sinks, etc., ensuring efficiency and reliability. Furthermore, Aluminum's excellent conductivity and corrosion resistance contribute to the overall performance and longevity of the charging infrastructure, which can facilitate the adoption of electric mobility on a larger scale.

### **A brighter, greener future in the making**

Automotive aluminium components have lower carbon emissions than steel and are easier to recycle, suiting a thriving scrap market. Almost 75% of all aluminium produced is still in use today, with over 90% recycling rates in the automotive and construction sectors. A strategic plan could make aluminium a solution for numerous automotive industry challenges. These advancements, however, require collaboration. The path to improved, lasting solutions demands joint efforts among industry stakeholders, which is key to driving industry growth and maximizing EV potential for a sustainable future. ■



合生产几何形状复杂和功能集成的铸件，以及电池托盘，铝都可以满足这些要求。

追溯铝在汽车行业应用的过程，人们不得不意识到它的迅速崛起。自 20 世纪 70 年代以来，铝在汽车中的使用量一直在激增，从当时的近 35 公斤增加到现在的近 150 公斤。正如 Frost&Sullivan 所提到的，未来五年，汽车中的铝使用量将平均增加近 1.5 倍，达到 250 公斤。

电动汽车制造业也发生了很大的转变。铝铸件已成为电动汽车行业的首选，砂型铝铸件在生产电动汽车的复杂零件方面大放异彩。大型铸件生产工艺具有显著的优势，包括减轻铸件重量，对提高电池的续航力至关重要。电动汽车市场规模的扩大证明铝铸件是必不可少的，其耐用性、复杂性和减重等优势，将推动电动汽车的进一步发展。沃尔沃承诺投资 12 亿美元在瑞典建立一个全新的专门制造电动汽车的部门，由此可以看出电动汽车市场的巨大潜力。

铝在电动汽车变革中的影响力是巨大的，超越了汽车本身。铝——这个银色的金属对整个电动汽车产业链的发展发挥着重要作用，包括关键的充电基础设施。铝的特性使其成为制造充电连接器、散热器的理想选择，确保了生产效率和可靠性。此外，铝优异的导电性和耐腐蚀性有益于充电基础设施的整体性能和寿命，有助于电动汽车的推广。

### **一个更加光明、更加绿色的未来即将到来**

汽车铝部件的碳排放量比钢铁低，更容易回收，迎合了蓬勃发展的废金属市场。现在，铝的可回收率达到 75%，汽车和建筑行业的铝回收率超过 90%。通过这一战略计划，使铝成为应对汽车行业挑战的解决方案。但是，进步的取得是需要各方合作的。找到更好的、更可持续的解决方案需要利益相关方的共同努力，这是推动行业发展和最大限度地发挥电动汽车潜力、从而实现可持续未来的关键。 ■

Source: [www.financialexpress.com](http://www.financialexpress.com)

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## China's Largest Binder Jet 3D Printer Released

### 国内最大粘结剂喷射 3D 打印设备发布

The "4m super sand 3D printer" and "binder jet metal 3D printer" which were the largest in China and developed by KOCEL Intelligent Equipment Co., Ltd. were officially launched during the "21st China International Foundry Expo"(METAL CHINA) on May 8.

Mr. Zhou Zhijun, Deputy General Manager of KOCEL, introduced the super sand 3D printing equipment KOCEL AJS 4000. As the largest sand 3D printer in China by now, it has the characteristics of large molding size, high efficiency, one-click printing, and can be used as a single machine or part of the production line. The maximum molding size is 4000\*2500\*1500mm, the printing efficiency is 1000L/h, the maximum printing weight of full box can be more than 20 tons, and printing accuracy is  $\leq \pm 0.5\text{mm}$ , which solves a series of difficulties, such as the number of sand types, complex configuration, and high labor intensity. It will be mainly used in wind power, large ships, large cast steel, heavy mining machinery, high-end heavy machine tools and other fields to provide green intelligent casting solutions for enterprises and promote the transformation of the industry.

The binder jet metal 3D printing equipment was displayed at the show, the forming size can be from 160mm to 800mm. The printer itself has advantages of intelligent, high quality, green, customization, etc.. It can be remotely operated and maintained. The forming accuracy can be up to  $\pm 0.05\text{mm}$ , quality monitoring, remote operation and maintenance systems are integrated. It can be used alone, but also supports logistics, pre-treatment, post-processing and other equipment, which integrated with intelligent unit system to build metal 3D printing digital plant.

In addition, KOCEL's AJS 4000 Industrial-grade Sand 3D Printer won the "National Foundry Equipment Innovation Award", and its Reciprocating Compressor Cylinder Casting won the award of "Special Gold Award for High Quality Castings". ■



共享智能装备有限公司在“第二十一届中国国际铸造博览会”期间举行“4m 超级砂型 3D 打印设备”、“粘结剂喷射金属 3D 打印设备”的发布仪式，至此，国内最大的砂型 3D 打印机、粘结剂喷射金属 3D 打印机正式面世。

共享智能装备有限公司副总经理

周志军先生介绍了超级砂型 3D 打印设备 KOCEL AJS 4000：作为目前最大的砂型 3D 打印设备，它具有成型尺寸大、高效率、一键打印等特点，并可根据使用需求，可单机也可组成生产线。该设备最大成型尺寸为 4000\*2500\*1500mm，打印效率 1000L/h，满箱重量可打印 20 余吨，打印精度  $\leq \pm 0.5\text{mm}$ ，解决目前砂型数量多、组型复杂、人工劳动强度大等一系列问题，将主要应用在风电、大型船舶、大型铸钢、重型矿山机械、高端重型机床等领域，为行业企业提供绿色智能铸造解决方案，助推行业绿色智能转型。

活动上展示了由共享智能装备自主研发的粘结剂喷射金属系列 3D 打印设备，成型尺寸涵盖 160mm-800mm。该设备本身具有智能化、高质量、绿色环保、定制化等优势特点，可实现无人值守、远程运维等。设备成形精度最高可达  $\pm 0.05\text{mm}$ ，集成质量监控、远程运维等系统，可单机使用，也可配套物流、预处理、后处理等设备，与智能单元系统集成金属 3D 打印数字化工厂。

此外，共享集团的 AJS 4000 工业级铸造砂型 3D 打印设备斩获“全国铸造装备创新奖”、往复式压缩机气缸铸件获得“优质铸件金奖特别奖”。■

## Productivity Up, Costs Down: Draxton's Barcelona Foundry Benefits From Industry 4.0

### 降本增效: Draxton 的巴塞罗那铸造厂受益于工业 4.0

Draxton, a global manufacturer of cast iron and aluminum components with a total annual casting capacity exceeding 620,000 tons, has reduced its downtime, energy use and resource consumption after deploying the Monitizer®|DISCOVER IIoT solution at its foundry in Barcelona, Spain.

The foundry produces complex components for brakes, powertrain and transmission systems, primarily for the automotive industry in North America, Europe and China. When the Barcelona team wanted a live digital view of production, it chose the modular Monitizer IIoT platform to collect data from various machines and processes. The project was supported by foundry technology experts DISA.

Javier Heredia, Plant Manager at Draxton Barcelona, comments: "Monitizer|DISCOVER has helped us implement and enhance lean manufacturing and predictive maintenance, and we use its information to constantly learn about and enhance different parts of our operations. It has definitely helped us improve casting quality while lowering resource and energy consumption. That has cut our carbon emissions and DISCOVER's digital process view will also be invaluable as we begin our new sustainability initiative."

#### Digitally connecting a foundry—end to end

The project began in June 2022. The first task was to digitally connect the furnace and pouring unit, along with the sand plant, the two DISA moulding lines, the entire suction system and the shotblast machines.

"Monitizer|DISCOVER connects to all our equipment, not just our DISA machines, to securely collect and bring all our data together in a single cloud database we can access from anywhere – even from my mobile when I am at home," says Javier. "It was 'plug and play' to install the NoriGate gateways ourselves. It was obvious this was a tried-and-tested system as the whole process went very smoothly and quickly."

Monitizer timestamps and merges new data, automatically updating the reliable, consistent single process view within its cloud database and calculating any required variables. The Monitizer team worked with Draxton to set up the database, creating its variables and the most useful KPIs.

#### Empowering teams, applying knowledge

With DISCOVER's sophisticated alarm functionality, Draxton has transformed how it controls its production. Using their specialist expertise, employees have configured automatic monitoring that alerts them to any upcoming problems.

Draxton 公司是铸铁和铝铸件的全球制造商，年产能超过 62 万吨。自从采用了 Monitizer®|DISCOVER IIoT 解决方案后，西班牙巴塞罗那的 Draxton 铸造厂避免了停机、减少了能源和资源消耗。

该铸造厂主要为北美、欧洲和中国的汽车行业提供制动器、动力总成和变速器系统的复杂零部件。当巴塞罗那工厂的团队需要实时的数字生产视图时，他们选择了模块化的 Monitizer IIoT 平台来收集各个机器和流程的数据。项目得到了铸造技术专家迪砂公司的支持。

巴塞罗那 Draxton 铸造厂的经理 Javier Heredia 说：

“Monitizer|DISCOVER 帮助我们实施和提升了精益制造和预测性维护，我们利用其信息持续了解和改善生产的不同环节。可以肯定的是，它有助于提高铸件质量，降低资源和能源消耗，从而减少了碳排放。当我们启动新的可持续发展计划时，DISCOVER 的数字视图也将是非常有意义的。”

#### 端到端的数字化连接

该项目于 2022 年 6 月启动。第一项任务是将熔化炉和浇注设备，以及砂处理设备、两条迪砂造型线、整个吸风系统和抛丸机进行数字化连接。

Javier 说：“Monitizer|DISCOVER 系统与所有设备进行连接，而不仅仅是迪砂造型线，可以安全地收集工厂的所有数据，并将其汇集在唯一的云数据库中，我们可以随时随地访问数据库，例如通过手机访问。我们自行安装 NoriGate 门户，它是‘即插即用’的，很明显，这是一个经过验证的系统，整个安装使用过程非常顺利且快速。”

Monitizer 记录、合并新数据，并自动更新其云数据库中可靠、一致的单流程视图，并计算所需的任何变量。Monitizer 团队与 Draxton 公司合作建立数据库，创建其变量和最有用的 KPI。

#### 赋能团队，运用知识



凭借 DISCOVER 复杂的报警功能，Draxton 公司改变了其生产控制的方式。凭借员工的专业知识，安装了自动监控系统，对可能出现的问题发出警报。

巴塞罗那 Draxton 公司的生产经理安东尼奥·鲁伊斯说到：“我们使用 DISCOVER 来监控生产和设备参数。每位员工都设置了个性化仪表盘，并设置了自己的查询问题，以准确接收他们想要查看的信息。该工具非常易于使用，也非常直观。我们可以利用自己的所学，轻松地对不同的仪表盘进行编程，并使用多个变量配置警报设置——全部由我们自己完成。

Antonio Ruiz, Production Manager at Draxton Barcelona, explains: "We use the tool to monitor production and facility parameters. Each user has made their own personalised dashboard and set up their own queries to receive exactly the information they want to see. The tool is very easy to use and also highly intuitive. We can use our own process knowledge to easily program different dashboard queries and configure alarms with more than one variable – all by ourselves. We can set thresholds based on the knowledge of our internal experts and configure alarms that notify production and maintenance to act before an issue become serious."

### Preventive maintenance: always ahead of wear

Monitizer has also enabled the maintenance team to implement a preventive maintenance program. For example, Monitizer helps Draxton identify premature wear in the furnaces; when any parameters move out of specification, the system automatically notifies both the maintenance and production teams.

Before implementing Monitizer, the Barcelona facility struggled to remove a bottleneck caused by insufficient moulding sand for their two lines. Using DISCOVER's data, it was possible to vary the sand plant's cycle time to match the amount of water added to the sand plant. This removed the bottleneck and stabilized sand quality, while cutting water and energy consumption – resulting in higher quality and a more sustainable process.

### What's next?

Now experts is using data to better manage their operation, the Draxton team is planning to add even more parameters to its digital foundry view and is working towards full and continuous, AI-powered process optimization using the Monitizer|PRESCRIBE AI solution. ■

我们可以根据专业知识设置阈值和配置警报，从而通知生产和维护部门在问题变得严重之前及时采取措施。”

### 在磨损发生之前采取预防性维护措施

Monitizer 还使设备维护团队能够制定预防性维护计划。例如，Monitizer 帮助 Draxton 公司识别熔炉中的过早磨损；当有任何参数超出规定时，系统会自动通知维护和生产团队。

在安装 Monitizer 之前，巴塞罗那工厂很难解决型砂产能不足带来的瓶颈问题。使用 DISCOVER 的数据监测功能，可以改变砂处理的循环时间，与添加到砂处理设备中的水保持一致。不仅解决了瓶颈问题，稳定了砂子的质量，同时减少了水和能源消耗，实现了更高的产品质量和更可持续的发展。

### 下一步计划

现在，Draxton 公司的专家使用数据更好地管理生产过程，他们计划在其数字铸造视图中添加更多参数，通过 Monitizer|PRESCRIBE AI 的解决方案，实现人工智能赋能下的全面的、连续的优化生产。■



## Focus Diecasting—Giant Casting Is Not About Thinking Bigger It`S About Thinking Better!

### 聚焦压铸——大型铸件不仅是更大、而是更好!

Thomas Fritsch, Chief Editor

Foundry-planet 主编 Thomas Fritsch

Interview with Dr. Marco Gandini, Senior Vice President of Global Aluminium at Norican and Managing Director at ItalPresseGauss

专访诺瑞肯集团全球铝合金事业部高级副总裁兼意特佩雷斯高斯董事总经理 Marco Gandini 博士



**Mr. Gandini, Die casting plays a prominent role at the world's leading trade fair GIFA in Düsseldorf. What personal expectations do you and your companies StrikoWestofen and ItalPresseGauss have for the fair?**

GIFA is always a special event in the calendar for us, but this year even more. Not least because so much has happened since the foundry world came together in Düsseldorf four years ago. The impact of COVID was hard hitting and remains far-reaching. From supercharging developments in terms of remote services to influencing the way, we look at supply chain risk management.

During that time, sustainability has also risen to

**Gandini 先生，压铸行业在杜塞尔多夫举行的世界领先的铸造行业贸易博览会 GIFA 上扮演着重要角色。您个人以及代表史杰克西、意特佩雷斯高斯公司对展会有什么期望？**

GIFA 对我们来说一直是一个重要的活动，今年更是如此。因为自从 4 年前大家在 GIFA 展相聚之后，已经发生了很多事情。新冠疫情的影响是巨大且深远的，从远程服务的发展到服务方式的转变，我们会更加关注到供应链的风险管理。

在此期间，可持续性也上升为全球议程的首要问题，实际行动应取代之前的理论研讨，这一事实无疑影响了压

the top of the global agenda - with practical action replacing previous theoretical discussion, a fact which has certainly impacted what die casters want and need from their melting and casting solutions. Coupled with dramatic shifts in energy costs, aluminium prices, and of course major sector developments – especially within the automotive industry in terms of e-mobility – I think it’s fair to say that at this year’s GIFA there is more to discuss than ever before.

**Amid the transformation in propulsion systems, solutions for e-mobility, lightweight construction, and large structural parts take center stage. What challenges do you see for foundries and suppliers?**

I think you’ve actually highlighted a key point in your question. While the trend for larger, lighter parts is set, the fact that we are still ‘amid the transformation’ is important. How parts are designed and what’s expected of them in terms of performance characteristics is still evolving, especially when it comes to e-mobility.

For die casters this means ensuring that equipment and processes are able to meet current needs, yet flexible enough to adapt without significant additional investment. Our responsibility as suppliers is to help customers in this regard; to make sure we are producing solutions which guarantee the cast part performance expected right now, alongside the adaptability that’s needed to futureproof casting operations and deliver a strong ROI.

The TFs Toggle Free Smart series range of HPDC from ItalPresseGauss, is a good example of this thinking in action. As well as offering the massive closing forces needed for casting larger structural components, its modular design means that die casters can tailor aspects such as tie bar distances and injection forces to perfectly align with current needs, safe in the knowledge that they can change modules (rather than have to buy a new machine) should customer requirements shift.

Adaptability is just part of the puzzle. There’s also a broader challenge inextricably linked to these developments. Especially in terms of serving the e-mobility market. And that is the challenge of sustainable production.

Almost all major car manufacturers have now committed to science-based targets (SBTs), formally agreeing to set emissions and net-zero targets in line with those climate science deems necessary to limit global warming to less than 2°C (most have based KPIs on the more ambitious target of 1.5°C). At Norican we are very familiar with what this entails, having signed up to it ourselves.

In order to reduce ‘total energy consumed per vehicle produced’, manufacturers need to look (and are already looking) at what exactly goes into producing their cast parts – the lower the carbon footprint the better. And the die casting industry is well aware of this pressure. Research of our global customer base revealed

铸企业对其熔炼和铸造解决方案的需求。加上能源成本、铝价格的急剧变化，当然还有主要行业的发展——尤其是汽车行业的电动化，客观地说，我认为这些话题在今年的GIFA上应该有更多的讨论。

**在动力系统的转型中，电动汽车、轻型结构和大型结构件的解决方案居核心位置。您认为铸造厂和供应商面临哪些挑战？**

我认为您已经强调了问题中的一个关键点。虽然大型轻量化零部件的趋势已经形成，但认识到“仍处于转型中”很重要。零部件的设计方式以及对其性能方面的要求仍在不断发展，尤其是在电动汽车方面。

对于压铸企业来说，这意味着要确保设备和工艺能够满足当前需求，但又可以足够灵活，无需大量额外投资即可适应需求。作为供应商，我们的责任是满足客户的需求，以确保我们提供的解决方案能够保证实现预期的铸件性能，以及满足未来的铸件生产技术，并提供有力的投资回报率。

意特佩雷斯高斯高压压铸机中的 TFs 智能无曲拐两板压铸机 (TFs Toggle-Free) 系列就是一个很好的解决方案。它除了具有可以铸造出更大的结构件所需的巨大锁模力外，其模块化设计意味着压铸企业可以定制拉杆距离和压射力等，以完全符合客户需求的变化。因为他们只需更换模块，而不必购买新的机器。

设备适应性只是难题的一部分，还存在与这些技术密不可分的更广泛的挑战。尤其是在电动汽车方面，这就是可持续的挑战。

现在，几乎所有主要的汽车制造商都致力于实现科学碳目标 (SBTs)，即把全球气温升幅控制在远低于工业化前水平的 2°C 之内，并努力把温升控制在 1.5°C 之内。诺瑞肯集团非常清楚这意味着什么，而且已经开始践行这一倡议。

为了减少“每辆汽车生产所消耗的总能源”，制造商需要（并且已经）开始研究先进的铸件生产工艺——碳足迹越少越好。压铸行业也很清楚地认识到其中的压力。研究显示，公司 81% 的全球客户群认为，由于最终用户对碳效率目标的要求，“更可持续”是赢得未来市场的关键。客户已经对很多压铸企业提出是否具备此类生产资质的要求。

**不管称之为“大型铸件”、“超大铸件”、“巨型铸件”还是“超级铸件”，无疑这都是目前正在热议的话题。这一趋势的发展方向是怎样的？但是采用的范围仍然相对有限——这是否表明并非所有人都相信这一趋势？**



that 81% see 'being more sustainable' as key to winning future contracts, due to end customer carbon efficiency targets. Many die casters are already being asked to demonstrate their credentials in this regard.

**Whether you call it giant, mega, giga or ultra-casting – this is a topic everyone talking about now. In which direction is this trend going? Adoption is still relatively limited – does this indicate that not everyone is convinced by it?**

I think it's less about being convinced by it and more about understanding your market.

Foundries, able to cost-efficiently cast larger, lighter structural components that help to reduce overall vehicle weight – and using fewer energy/producing less emissions at the same time – will gain a competitive advantage in the automotive market. The right giant casting technologies definitely help fulfil this brief. But if that's not your primary focus, then investing in this area may understandably not hold the same appeal.

Many of our customers do have this as their primary focus, meaning we have developed solutions to match. But equally, we also work with smaller foundries and die casters in other markets, so we make sure that our product ranges span a breadth of applications.

In terms of the direction of travel for giant casting, however, I'd say it's not just about thinking bigger. It's about thinking 'better'. There are a lot of factors to consider in terms of getting the best possible results.

StrikoWestofen's LeanMelter suite of solutions for giant casting applications is a great example. It gives aluminium die casters the opportunity to carry out melting, holding, and dosing within the casting cell – a far more efficient way to support the high metal throughput you need for casting large structural components at speed. It has also been developed with modularity in mind, meaning that die casters can mix and match the individual components to best suit their specific giant casting requirements.

Similarly, achieving the best results with giant casting doesn't simply mean choosing a machine with bigger closing forces. There's much more to it. With the TFs Toggle Free Smart series, for instance, we've made our giant casting machines lighter, so they use less energy during production cycles. Well equalised tie bars, a closure mechanism able to automatically compensate for geometrical imperfections of the die, plus a shot control system that works intelligently to detect and automatically compensate for metal flow variation. These design details all help to deliver casting consistency and support scrap reduction.

我认为，与其说是相信趋势，不如说是了解市场。铸造企业能够以更具成本效益的方式生产更大、更轻的结构部件，不仅有助于减轻汽车的重量，同时使用更少的能源、产生更少的碳排放，从而可以在汽车市场具备竞争优势。采用适合的大型铸件生产技术无疑有助于实现这一目标。但是，如果你并不关注这一领域，那么你也不会对该领域的投资感兴趣。

我们的很多客户对此确实非常关注，同时意味着我们已经开发出了相对应的解决方案。我们也与其他领域的小规模铸造厂和压铸厂合作，确保公司的产品有更广的应用范围。

然而，就大型铸件的发展方向而言，我认为不仅仅是考虑更大的问题，而是如何才能“更好”。要想获得最好的结果，需要考虑很多因素。

史杰克西的 LeanMelter 大型铸件解决方案就是一个很好的例子。它使铝压铸企业可以在一个铸造单元内进行熔化、保温和定量，这是一种更有效的方式，支持快速铸造大型结构件所需大量的金属液。该方案也考虑到了模块化技术，意味着压铸企业可以综合或使用单个组件，以最好地适应特定大型铸件的生产要求。

同样，获得大型铸件的最佳效果并不意味着简单地选择一台锁模力更大的压铸机，还要考虑更多因素。例如，通过 TFs 智能无曲拐两板压铸机 (TFs Toggle Free) 系列，压铸机更轻，因此它们在生产周期中消耗的能源更少。均衡的拉杆、能够自动补偿模具几何形状缺陷的闭合机制，以及智能检测和自动补偿金属液流量变化的压射控制系统，这些设计细节都有助于实现铸件生产的一致性，并可以减少废料的产生。当谈论“大铸件”的时候，小细节更重要。

**GIFA 的另一个重要主题是铸造生产的数字化，与你们正在讨论的其他趋势是否契合，对压铸机企业意味着什么？**

数字化趋势非常契合大型结构件趋势。特别是在可持续铸造方面，无论是大型结构件还是其他铸件生产都应符合这一趋势。数字化解决方案即工艺优化——助力压铸机生产质量更好的零件（产生更少的废料）、生产速度更快、停机时间更短、更节能，这些都有利于提高生产力和减少碳排放。

你无法在你不了解的领域有所提升。因此，能够整理和查询整个铸造生产线产生的数据，为压铸企业提供了宝贵的机会，让他们准确地了解具体的设置或条件在

When it comes to going ‘big’, small details matter.

**Another important subject at GIFA is the digitization of foundry operations. How do you think this fits in with the other trends we are watching, and what does this mean for die casters?**

It fits very well indeed. Particularly in terms of sustainable casting, giant or otherwise. Digital solutions are all about process optimisation – about helping die casters to produce more good parts (less scrap), faster, with less downtime, using fewer resources. All of them are good news for productivity and for carbon footprints.

You can’t improve what you don’t know. So being able to collate and interrogate data generated across an entire casting line, provides a valuable opportunity for die casters to see exactly where (which phase or process) and when specific settings or conditions are impacting process times, cast parts produced, energy consumed and scrap rates. Once you know where to look and what to focus on fixing, it becomes much easier to achieve better results.

Some AI-based solutions, like Monitizer Prescribe for instance, also provide the opportunity to detect issues and to automate corrective measures in real time, thereby preventing potential scrap-inducing problems before they can negatively impact production.

Additionally, it is worth remembering that digital solutions also enable things like remote support and troubleshooting, as well as avoiding emissions linked to travel (for technical engineers to conduct site visits). This will help to avoid periods of inefficiency or downtime, both of which can negatively impact overall environmental performance. ■

哪个阶段或工艺过程，以及什么时间影响生产周期、铸件、能耗和废品率。只要你知道通过什么方式来了解，以及应该专注于做的工作，就更容易获得更好的结果。

一些基于人工智能的解决方案，如 Monitizer，也可以实时检测问题和采取自动纠正措施，从而在导致废品产生以及对生产产生负面影响之前防止此类问题发生。

此外，值得记住的是，数字化解决方案还可以实现远程支持和故障排除，而无需技术工程师现场操作，减少碳足迹。这将有助于避免生产效率低下、减少停机时间，因为他们都会对整体环境性能产生负面影响。■



# Rheocasting By Sag - The Semi-Solid Casting Process Has Significant Advantages

## 流变铸造——半固态铸造工艺具有显著优势

Thomas Fritsch, Chief Editor  
Foundry planet 主编 托马斯·弗里奇



The special casting process in which aluminum is cast in a semi-solid or semi-liquid state, so-called rheocasting, seems to be in vogue at the moment and there are good reasons for this.

Only recently at the Aalen Foundry Colloquium we met Fabian Hofstätter from Salzburger Aluminium AG (SAG), who gave an interesting talk on the subject.

We are particularly interested in the advantages of the process and which components are specifically suitable. With regard to the advantages of rheocasting, several major focal points immediately stand out, which are of utmost importance for aluminum components.

Air reservoir finished product (requirement: helium-tight welded) Copyright: SAG, Fotografin: Karin Pasterer

### **Optimum mechanical strength and elongation**

Area of application: vehicle components, chassis parts, chassis-relevant components

### **Up to 60% less weight**

Compared to steel parts, higher fatigue strength, ideal for automotive applications.

### **Excellent weldability and compressive strength**

铝以半固态或半液态的形态进行浇注的特殊铸造工艺，即所谓的流变铸造。流变铸造目前似乎成为一种流行趋势，其理由是充分的。

近日，我们在阿伦铸造学术研讨会上遇到了萨尔茨堡铝业公司（SAG）的 Fabian Hofstätter 先生，他就此发表了有趣的演讲。

我们特别感兴趣的是该工艺具有哪些优点以及适用于生产什么铸件。流变铸造有几个突出的优点，对铝铸件的生产至关重要。储气罐成品件（生产要求：氦气密封焊接），图片版权：SAG, Fotografin: Karin Pasterer

### **最佳的机械强度和延伸率**

应用领域：汽车零部件、底盘铸件、底盘相关零部件  
**铸件重量减少 60%**

与铸钢件相比，其疲劳强度更高，是汽车应用的理想选择。

### **优异的焊接性和抗压强度**

应用范围：汽车零部件、底盘零部件、压力容器、

Application range: vehicle components, chassis parts, pressure vessels, coolers, pumps.

### **Best thermal and electrical conductivity**

20% higher thermal conductivity.

Application area: telecommunications, battery technology, line electronics.

### **No post-processing necessary**

Cost effective as no milling, deburring or grinding required.

Applications: Visible components, interior parts, brake discs.

### **Full freedom of design**

Different wall thicknesses possible, high functional integration in the field of bionics. Weight optimization with the same installation space.

In summary, it can be concluded that amazing results can be achieved with the rheocasting process. The high strength and ductility, very good weldability and conductivity of rheocasting components enable efficient lightweight construction in many areas. Less weight leads to more range and lower energy consumption. Rheocasting can thus contribute to CO2 emission reduction with considerable weight savings. More efficiency in the production process: Rheocasting can avoid costly reworking of castings. The engineers at SAG were the first to industrialize the rheocasting process and today also offer large series of up to 400,000 parts.

Among the impressive components Fabian Hofstätter presented in his paper in Aalen were helium pressure-tight components, air spring tool systems. For these components, the low porosity of the material, the strength and the outstanding mechanical properties are particularly important.

### **Innovative, sustainable, international**

SAG is an internationally active company with Austrian roots. Thanks to highly trained employees, tank solutions and lightweight components for vehicle construction are developed and produced at a total of 10 locations in Europe, Mexico and the USA. The R&D know-how as well as the product and service portfolio are constantly being expanded. SAG is a technology leader in many areas of the materials sector and in the field of cryogenic tanks.

Aluminium brings lightness to vehicle construction. Due to its low weight and corrosion resistance, it has excellent mechanical properties. In addition, it is extremely versatile, 100% recyclable without any loss of quality and thus a very resource-saving raw material.

SAG is the world market leader in the field of rheocasting. The Salzburger Aluminium Group has been successfully supplying international customers with its innovative quality products for many years - from the automotive, railway and aviation industries to the energy sector. ■

冷却器、泵。

### **最佳导热性和导电性**

导热系数提高 20%

应用领域：电子通信、电池、电线。

### **无需后处理**

无需铣削、去毛刺或磨削，具有成本效益。

应用领域：有形组件、内部零件、制动盘。

### **设计完全自由**

可以生产不同壁厚的铸件，在仿生学领域具有高度的功能集成性。在相同的安装空间内，实现重量优化。

总之，可以得出的结论是，流变铸造工艺可以取得惊人的效果。流变铸造所具备的高强度、高延展性、良好的焊接性和导电性使其能够为很多领域生产高效且轻质结构的铸件。重量越轻，续航里程越大，能耗越低。因此，流变铸造可以显著减轻铸件重量，有助于减少二氧化碳排放。流变铸造可以避免昂贵的铸件返工，从而提高生产效率。萨尔茨堡铝业公司（SAG）的工程师最先使流变铸造工艺实现了产业化发展，现在，他们可以进行高达 40 万件铸件的大批量生产。

Fabian Hofstätter 先生在阿伦铸造学术研讨会发表的论文中，令人印象深刻的铸件包括氦气耐压组件、空气弹簧工具系统。对于这些部件，材料的低孔隙率、卓越的强度和机械性能尤为突出。

### **创新性、可持续性、国际化**

SAG 公司是一家根植于奥地利、活跃于国际市场的公司。得益于具有熟练技术的员工，公司在欧洲、墨西哥和美国共设有 10 个工厂，开发和生产用于汽车的油箱解决方案和轻型零部件，其研发技术、产品和服务组合不断扩大。SAG 公司是材料行业和低温储罐的多个领域的技术领导者。

铝铸件使车辆结构实现了轻量化。由于重量轻且耐腐蚀，铝具有优异的机械性能。此外，它用途广泛，可回收率达 100%，不会损失任何质量，因此是一种节约资源效果非常好的原材料。

SAG 公司是流变铸造领域的全球市场领导者。多年来，SAG 公司不断地为包括汽车、铁路、航空业及能源行业在内的国际客户提供创新的优质产品。■



## Norican Group: “We Believe Sustainability And Profitability Must Go Hand In Hand - And It Can!”

### 诺瑞肯集团：“可持续性和盈利能力必须两手抓”

Thomas Fritsch, Chief Editor  
 Foundry planet 主编 托马斯·弗里奇

Sustainability is currently one of the most discussed issues in the foundry industry. In this interview, Anders Wilhjem, CEO of the Norican Group, explains why sustainability and profitability can go hand in hand. Thereby, he also explains what it needs to succeed in digitalization as well as how digitization and automation support foundries / die-casters.

**Foundry-Planet:** What is your opinion about this year's GIFA? How was it compared to previous GIFA exhibitions?

**Anders Wilhjem:** It was a more mixed audience than before. We were generally pleased with the traffic in our GIFA stand - it looked like we were getting more than our fair share of interest. We were excited about being able to present both Simpson and Monitizer in addition to our other brands, two new brands that hopefully makes Norican an even more compelling partner for the foundry / die casting industry.

**Foundry-Planet:** This year, you featured a dedicated sustainability zone on your GIFA stand. Is this now a fundamental part of your business?

**Anders Wilhjem:** Yes, sustainability already is, or

可持续发展是当前铸造行业的热点话题之一。在这次采访中，诺瑞肯集团首席执行官 Anders Wilhjem 解释了为什么可持续性和盈利能力可以同时实现，他还介绍了如何在数字化方面取得成功，以及数字化和自动化如何支持铸造企业或压铸企业的发展。

**Foundry-Planet:** 您如何看待今年的 GIFA 展？与之前相比有什么变化？

**Anders Wilhjem:** 观众比以前更加多元化。我们对 GIFA 展的观众流量总体上很满意，超出了我们的预期。我们很高兴能够在展示我们的其他品牌基础上，还推出了 Simpson 和 Monitizer，这两个新品牌有望使诺瑞肯集团成为铸造 / 压铸行业更具吸引力的合作伙伴。

**Foundry-Planet:** 诺瑞肯集团在今天的 GIFA 展上设立了一个专门的可持续发展区，这是公司业务的基本组成部分吗？

**Anders Wilhjem:** 是的，可持续发展已经或将成为客户和诺瑞肯集团的关键业务。我们看到可持续性对不同

will become, business critical for our customers and for Norican. We see differences in how high this is on the agenda of our customers - there are geographical differences, and also differences depending on which markets our customers serve. Right now, sustainability is a differentiator for some of our customers, but we believe this will quickly become a ticket to play: if you do not act sustainably, you will be disqualified either through regulatory requirements or through customer consumer preferences. The same applies to Norican. For Norican, we have made clear that we want to contribute our part in leaving the planet in a better condition than when we inherited it. This is big pledge, but we believe it is the right ambition in a few different ways. It will strengthen our innovation focus, it will affect our attraction as an employer and supplier, it will affect how and what we procure, and it will drive our top and bottom line. We believe sustainability and profitability must go hand in hand - and it can!

**Foundry-Planet:** What is the target for a foundry/die casters for being more sustainable? Do you see digitization as key to removing tedious or dangerous human tasks by digitizing or automating them to reduce the dependency on skilled/experienced labour, which is becoming harder to get. Where do you see the differences, and how will the markets develop?

**Anders Wilhjelm:** Digitization is high priority in all regions, whereas the customers' interest in and focus on sustainability varies by customer segment. In general, we don't believe that there will be much difference between the various regions of the world going forward. The main difference is probably going to be the speed with which it will happen.

We can prioritize our emission reduction efforts according to where we get the biggest impact"-Anders Wilhjelm

**Foundry-Planet:** What does this mean for a global group like Norican, which covers a wide range of foundry processes in all industrial markets in the world! Are there synergy effects? How do you see the future of technological development and where are the best chances?

**Anders Wilhjelm:** On sustainability, it's straightforward for Norican to think global and to act local. We can prioritize our internal emission reduction efforts according to where we get the biggest impact. For example, investing in green energy (solar) in China and India has a higher priority than in Germany. On digital, we have from the very beginning been focusing on two things in our external digital efforts - today known as Monitizer 1. How digital tools gave our customers business in terms of savings profits. 2. Making a hardware-agnostic effort, which links to the first point since most of our customers do not only

地区、不同市场细分领域客户的重要性存在差异。目前，客户对可持续发展的重视程度是不一样的，但我们相信可持续将很快成为参与市场竞争的入场券：如果不采取可持续的措施，企业将因监管要求或客户以及消费者的选择而被市场淘汰。对诺瑞肯集团来说也是如此。我们已经明确表示，我们希望能为地球的可持续发展做出自己的贡献。这是一个重要的承诺，我们相信这是一个正确的决策。以此为发展方向，将加强公司的创新能力，增强我们作为雇主和供应商的吸引力和影响力，从而影响我们的采购方式和内容，并提高我们的利润和价格。我们相信可持续性和盈利能力必须两手抓——而且是可以实现的！

**Foundry-Planet:** 铸造或压铸企业的可持续发展目标是什么？您是否认为数字化是消除单一、危险的人工作业的关键？或者通过数字化或自动化来减少企业对熟练技术工人的过度依赖，因为熟练技术工变得越来越难招聘。这其中有什么不同呢？市场将如何发展？

**Anders Wilhjelm:** 数字化在世界各地都是高级优先事项，而客户对可持续性的关注度因客户群体而异。总的来说，我们认为世界各地之间不会有太大差异，主要的差异可能是数字化转型的速度。

“我们可以根据公司在不同地区的市场影响力来决定减排的先后顺序。” -Anders Wilhjelm

**Foundry Planet:** 对于像诺瑞肯集团这样的国际化企业来说，这意味着什么？诺瑞肯集团的产品和技术涵盖了应用于所有工业领域的铸造技术，是否存在协同效应？您如何看待未来的技术发展，最佳的机会窗口在哪里？

**Anders Wilhjelm:** 关于可持续性，诺瑞肯集团很容易做到“全球化思考，本土化行动”。我们可以根据地区影响力的大小来考虑我们的内部减排顺序。例如，在中国和印度投资绿色清洁能源（太阳能）的优先级高于德国。在数字化方面，我们从一开始就专注于企业数字化解决方案的 2 个问题，也就是 Monitizer，问题之一是：数字化工具如何帮助客户实现利润；问题二与第一个问题相关，即进行与硬件无关的改进，因为我们的大多数客户的工厂不仅安装有诺瑞肯的设备。

正如您所知道的，我们为数字解决方案创建了一个单独的品牌 Monitizer，因此，我们的数字化方案与公司自有设备配合的很好，而且与其他供应商的设备配合也很好。这也是我们欢迎设备和耗材供应商关注 Monitizer 的原因，请他们考虑将它作为一个好的接口解决方案，而不是制定单独的解决方案。能够拥有相互沟通良好的数字系统是所

## INTERVIEW / 企业专访

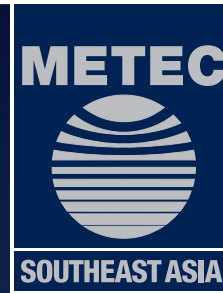
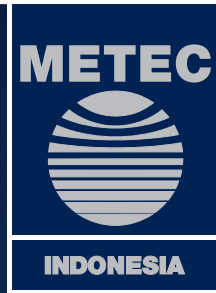
have Norican equipment in their plants.

As you have seen, we have created a separate brand Monitizer for our digital solutions for exactly this reason our digital solutions work very well with our own equipment, but it also works well with other suppliers' equipment. This is also why we welcome equipment and consumables manufacturers to look at Monitizer and consider if this would be a good solution to interface with rather than making their own solution. Having digital systems that speak well with each other is at the end of the day what all our customers want.

A customer obviously still needs specific digital functionality in relation to, for example, a moulding machine or to a furnace, but they don't need more than one IOT platform in their plant. Of other synergies, I think it's obvious that the more machine data is captured, the more intelligent equipment manufacturers can optimize their hardware. By capturing data, and converting it into knowledge, this will only help in making better machines and improving our service to customers. ■

有客户需要的。

显然，客户仍然需要与造型机或熔炼炉相关的专项数字化功能，但他们的工厂并不需要一个以上的物联网平台。在其他协同效应中，很明显，我认为获取的机器数据越多，就越有利于智能设备制造商优化硬件。通过数据获取并将其转化为知识，将不仅有助于制造更好的机器，还能提升我们的客户服务水平。■



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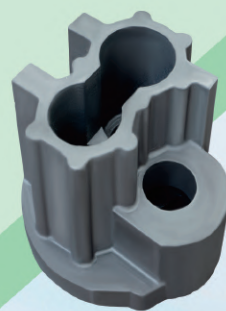


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