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APRIL VOLUME15 NUMBER 1

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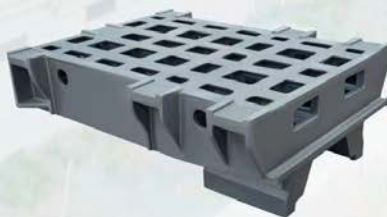
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Production of gray iron castings, Ductile iron castings





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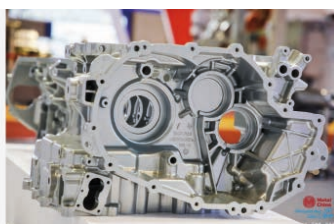
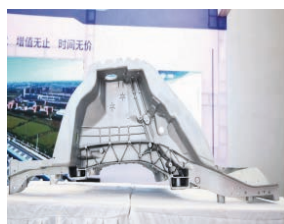
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CITIC Plant in Morocco Gets Africa's first Lighthouse Factory Tag

中信集团点亮非洲第一家“灯塔工厂”

On January 14, 2025, CITIC Dicastal's Morocco plant has been recognized as Africa's first "Lighthouse Factory", recognized by the World Economic Forum, marking a major milestone in the continent's adoption of intelligent manufacturing. A "Lighthouse Factory" represents the highest standard in intelligent manufacturing and digitalization, serving as a model for best practices in applying "Industry 4.0" technologies.

The "Lighthouse Factory" of CITIC DICASTAL Morocco, located in the Atlantic Free Trade Zone of Guenitra, Morocco, covers an area of about 25.33 hectares, including the first and second phases of aluminum wheels and castings. With an annual capacity of 6 million aluminum wheels and 5 million aluminum castings, it is the largest investment project since the establishment of a strategic partnership between China and Morocco in 2016.

From AI-driven control towers to zero-code workflows, Lighthouses exemplify sustainable innovation, setting benchmarks that millions can follow to drive transformational change across the entire ecosystem. The factory employs advanced intelligent manufacturing technologies, integrating smart equipment, real-time network monitoring, big data analytics, and artificial intelligence into production processes. These innovations have tackled key industry challenges such as casting process control, defect detection, mold maintenance and energy resource management, said the company.

The adoption of artificial intelligence and big data technologies has significantly boosted operational performance, increasing overall equipment efficiency by 17.35 percent, enhancing labor productivity by 26.58 percent and reducing the product defect rate by 31.11 percent.

In the next step, CITIC DICASTAL will continue to help the global auto parts manufacturing industry to climb to a new level, and make new and greater contributions to China-Africa practical cooperation in the new era and the transformation and upgrading of traditional manufacturing industries. Source: CITIC DICASTAL. ■

2025年1月14日,世界经济论坛正式发布了新一批“灯塔工厂”名单,中信集团旗下中信戴卡摩洛哥工厂成功入选,正式点亮非洲第一家“灯塔工厂”。“灯塔工厂”是“工业4.0”技术应用的最佳实践工厂,代表当今全球制造业领域智能制造和数字化最高水平。

位于摩洛哥盖尼特拉大西洋自贸区的中信戴卡摩洛哥“灯塔工厂”,占地面积约25.33公顷,包含铝车轮一期、二期和铝铸件共三期工厂,合计形成600万件铝车轮、500万件铝铸件产能规模,是中摩两国建立战略伙伴关系以来的最大投资项目。

在中信戴卡摩洛哥“灯塔工厂”内, AI技术与大数据深度交融贯穿生产全链路。通过应用“互联网+智能制造”先进技术,形成五大创新用例,在生产制造中广泛采用智能化设备,网络实时监控、大数据分析、人工智能识别,逐一攻克了铸造过程调控、成品重量管控、内外缺陷检测、模具智能维护、能源资源管理等产业级难题。

整体上,设备综合效率提高17.35%,劳动生产率提高26.58%,产品不良率降低31.11%。从原材料的选择到成品的包装,每一个环节都在智能系统的精确控制下实时调整并高效运行,通过智慧互联,为非洲工业发展开启了智能制造新可能。

下一步,中信戴卡将持续助力全球汽车零部件制造产业向新攀登、向优进阶,为新时代中非务实合作和传统制造产业转型升级作出新的更大贡献。(信息来源:中信戴卡) ■

China Baowu and China FAW Deepening Strategic Cooperation

中国宝武与中国一汽深化战略合作协议签约

On January 17, 2025, China Baowu and China FAW formalized an enhanced strategic cooperation agreement in Changchun, Jilin Province. Both parties will deepen strategic

2025年1月17日,中国宝武与中国一汽深化战略合作协议在吉林长春签约。双方将进一步加强战略沟通,在原有先进碳钢板带材合作的基础上,推动在新材料、绿色低碳

dialogue and expand collaboration into new materials and green, low-carbon initiatives, building on their existing advanced carbon steel plate and strip partnership. Additionally, they will continue to innovate business models with a focus on demand-driven strategies, promoting collaborative innovation across the industrial and supply chains. This will continuously enhance core functionalities and competitiveness.

FAW is a prominent state-owned automotive enterprise group, serving as the cradle of China's automobile industry. Since the 1990s, Baowu and FAW have collaborated on materials for Jetta bodies and Red Flag vehicles, establishing a cooperation history spanning over three decades. In 2001, the two parties signed their first strategic cooperation agreement. And in 2002, they established a joint laboratory. In 2003, the first joint venture machining center was inaugurated. In 2017, the "Strategic Cooperation Framework Agreement" between China FAW and China Baowu was signed, further promoting collaboration in the development and application of new materials, processes, and technologies, early-stage involvement, and comprehensive material solutions. Over the years, this partnership has yielded significant achievements, resulting in over 100 technical cooperation outcomes. These advancements cover the entire series of FAW products, with more than 40 being first-of-their-kind technologies for Red Flag vehicles, which have not only advanced material technology but also enhanced vehicle performance and competitiveness. Source: China Baowu. ■

等领域的合作。同时，不断创新商业模式，以需求为导向，推进产业链供应链协同创新，不断增强核心功能，提升核心竞争力。

一汽是国有特大型汽车企业集团，是新中国汽车工业的诞生之地。宝武与一汽自上世纪九十年代捷达车身用材国产化、红旗轿车材料国产化合作开始，已有 30 多年合作历史。2001 年，双方首次签署战略合作协议；2002 年，成立联合实验室；2003 年，设立首个合资加工中心。2017 年，《中国一汽与中国宝武战略合作框架协议》签署，在新材料、新工艺、新技术研发和应用，先期介入和综合材料解决方案等方面持续推进合作。多年来，双方合作成效显著，已形成超百项技术合作成果，车型覆盖一汽全系列产品序列，其中 40 多项是红旗首用技术，促进材料技术进步的同时，也提高了整车的性能和竞争力。（信息来源：中国宝武）■

YIZUMI and KUKA Sign Strategic Agreement in Smart Manufacturing

伊之密与库卡签署战略合作协议

On January 17th, YIZUMI and KUKA Robotics Guangdong Co., Ltd. hold a strategic partnership signing ceremony at YIZUMI Global Innovation Center. Amid the rapid growth of smart manufacturing and industrial robotics, this partnership marks a new chapter in the collaboration between YIZIMI and KUKA's , showcasing their shared commitment to innovation and industry transformation.

A Strategic Opportunity: Joining Forces for Mutual Success

As an advanced provider of industrial molding equipment system and service, YIZUMI is dedicated to the research, development, and production of molding equipment for polymer and metal

2025 年 1 月 17 日，伊之密与库卡机器人（广东）有限公司在伊之密全球创新中心举行战略签约合作仪式。在全球经济一体化加速推进、智能制造行业蓬勃发展，特别是工业机器人风口正劲的背景下，此次合作不仅标志着伊之密与库卡在智能制造领域的深度合作开启了新篇章，更彰显了双方推动智能制造技术革新、引领行业转型升级的共同愿景与坚定决心。

战略契机相遇 强强联手谋共赢

伊之密作为中国模压成型装备制造业的头部企业，致力于高分子材料和金属材料模压成型装备的研发与生产，拥

materials. With strong technical capabilities and a solid market foundation, YIZUMI's advanced solutions have demonstrated exceptional performance across various sectors, including electric vehicle, home appliances, and medical applications, earning widespread acclaim from global customers. KUKA Group is an internationally renowned automation company with sales exceeding 4 billion euros and approximately 15,000 employees. KUKA China is a subsidiary of KUKA Aktiengesellschaft (Germany) established in China. Guided by the Strategy of Localization, Globalization, and Diversification, and adhering to the principle of "Product-centricity" along with an unwavering commitment to the ultimate QCD (Quality, Cost and Delivery) service approach, KUKA China provides customers with One-stop solutions. These solutions include industrial robots, autonomous mobile robots (AMRs) and their controllers, industrial software, cloud - based digital services, and fully interconnected production systems. The industries it serves cover a wide range, such as automotive (with a focus on electric vehicles), battery, electronics, metal and plastics, consumer goods, food, e-commerce, retail, and healthcare. Actively engaging in local competition, KUKA China adapts to mainstream demands and offers platform - based, standardized products that enjoy advantages across all product categories.

This partnership combines YIZUMI's manufacturing expertise with KUKA's advanced robotics, aiming to expand global market reach, enhance brand influence, and achieve mutual success in the fast-growing industrial robotics sector.

Broad Collaboration for Innovation and Industrial Upgrading

The strategic partnership between YIZUMI and KUKA will focus on robotic automation, smart manufacturing integration, and high-end equipment development. Both companies will leverage their strengths to drive innovation and industry upgrades, particularly in industrial robotics. For KUKA, YIZUMI's strong presence in the Chinese market will provide new opportunities for collaboration. Together, they will develop products and services to meet the growing demand for smart manufacturing solutions, particularly in industrial robotics.

For YIZUMI, the partnership will boost the company's smart manufacturing capabilities and strengthen its automation solutions across industries. By leveraging KUKA's advanced technology, YIZUMI will improve product quality and efficiency, accelerating its



有雄厚的技术实力和市场基础。其先进的解决方案在新能源汽车、家电、医疗等多个领域展现出卓越的应用成效，赢得了国内外客户的广泛赞誉。库卡集团是国际知名自动化公司，销售额超 40 亿欧元，约有 1.5 万名员工。库卡中国是其在华子公司，设有机器人、移动机器人、系统集成、工业自动化、瑞仕格物流自动化、瑞仕格医疗六大业务板块。公司秉持本土化、国际化、多元化的经营理念，坚持“产品为王”，致力于提供极致的 QCD 服务，为客户提供工业机器人等一站式解决方案及全面的互联生产系统。业务覆盖汽车（尤其是电动车）、电池等多个行业，凭借平台化、标准化的全品类产品，积极参与本土竞争，满足主流市场需求。

此次合作，伊之密凭借其在装备制造领域的丰富底蕴，与库卡在机器人及自动化领域的卓越技术相辅相成，形成了相互促进的局面。双方战略高度契合，共谋全球市场拓展。双方希望通过此次合作，进一步提升品牌影响力，实现互利共赢。

合作领域广泛 产业升级共创新

伊之密与库卡的战略合作将涵盖机器人自动化解决方案、智能制造系统集成、高端装备研发与生产等多个关键领域。双方将充分发挥各自的专业优势，共同探索智能制造的新模式、新技术、新应用，特别是在工业机器人领域，将携手推动产业升级与技术创新迈向新的高度。对库卡而言，伊之密在中国市场的深厚根基和广泛影响力，将为库卡开辟更多市场机遇和业务合作空间。双方将携手开发适应中国市场需求的产品和服务，以满足客户对智能制造解决方案，尤其是工业机器人解决方案的迫切需求。

对伊之密而言，此次合作有助于提升其智能制造水平，增强其在不同行业提供自动化和整体解决方案的能力。通过引入库卡的先进技术，伊之密将进一步提升产品质量和

global strategy with KUKA's brand influence and customer network.

Together Towards a Bright Future and Building Success

YIZUMI and KUKA will collaborate in R&D, technical exchanges, and resource sharing to advance smart manufacturing, with a focus on industrial robotics innovation. They will also strengthen partnerships with global research institutions to introduce and adapt advanced technologies, driving continuous innovation in smart manufacturing. Meanwhile, the collaboration will expand customer resources and business reach, developing products and services for global markets, with a focus on emerging markets. They will adapt to market trends and customer needs, adjusting strategies to meet diverse global demands. In the future, YIZUMI and KUKA will build an open, collaborative ecosystem to drive innovation in industrial robotics and accelerate the growth of smart manufacturing. Together, they will strengthen their global strategies, contributing to the advancement of the global smart manufacturing industry. Source: YIZUMI. ■

生产效率,从而更好地满足市场对高品质、高效率智能制造装备的需求。借助库卡在全球市场中的品牌影响力和客户网络,伊之密的全球化战略将得到更快推进。

携手并肩前行 共铸辉煌展未来

通过合作研发、技术交流、资源共享、项目合作等多种方式,伊之密与库卡将共同促进智能制造技术的研发和应用,特别是在工业机器人领域加强技术创新与合作。双方将加强与国际先进研究机构的合作,积极引进并消化吸收国际先进技术,不断推动智能制造技术的创新与发展。在市场拓展中,伊之密与库卡将携手拓展客户资源,拓宽业务范围。双方将共同开发适应全球市场需求的产品和服务,特别关注新兴市场,紧跟市场动态,密切关注客户需求变化,灵活调整产品结构和市场策略,以满足全球不同市场的多元化需求。未来,伊之密与库卡将共同构建开放、协同、共赢的产业链生态体系,深度布局并创新工业机器人领域,推动智能制造行业的蓬勃发展。同时,双方将深入实施全球化战略,为全球智能制造行业贡献更多智慧和力量。(信息来源:伊之密) ■

NIO Self-developed Large Casting "NIO-2" Completed Verification and Went into Mass Production

蔚来自研大铸件新合金“NIO-2”完成验证并量产

Recently, NIO has made a major breakthrough in the field of material research and development, and its self-developed aluminum alloy material for high-pressure casting (HPDC)-self-hardening new alloy "NIO-2" has completed a comprehensive verification, and has been successfully applied to NIO ET9 and ONVO L60 body in white manufacturing. This achievement not only marks the innovative progress of NIO in automotive manufacturing material technology, but also brings new opportunities for the application of high-pressure casting technology in the entire automotive industry.

As the industry's first self-hardening aluminum alloy for structural large castings developed by a Chinese automobile brand, the success of "NIO-2" is a milestone. It broke the monopoly position of C611 aluminum alloy in China's large die-casting market, triggered a boom in the development of heat-treatment-free die-casting aluminum alloy in China's automobile industry, and provided new ideas and directions

近日,蔚来汽车在材料研发领域取得重大突破,其自主研发的用于高压铸造(HPDC)的铝合金材料——自硬化新合金“NIO-2”完成全面验证,并成功应用于蔚来ET9以及乐道L60白车身制造。这一成果不仅标志着蔚来在汽车制造材料技术上的创新进步,也为整个汽车行业的高压铸造技术应用带来了新的机遇。

作为业内首款由中国汽车品牌开发的结构大型铸件用自硬化铝合金,“NIO-2”的成功上车具有里程碑意义。它打破了C611铝合金在中国大型压铸市场上的垄断地位,引发了中国汽车行业开发免热处理压铸铝合金的热潮,为国内汽车制造企业在材料选择和工艺创新上提供了新的思路 and 方向。

for domestic automobile manufacturing enterprises in material selection and process innovation.

The research and development and verification of the new alloy "NIO-2" is carried out by the NIO Materials Research and Application Laboratory team (hereinafter referred to as: MRA). Before being applied to body-in-white manufacturing, MRA team jointly designed, manufactured, industrialized and other departments, and went through three strict verification processes of sample level, component level and vehicle level. Gary Hughes, MRA team leader, said: "It is NIO's standard practice that we strictly control our verification programs, especially our well-established three-level verification process, to ensure reliable data. After balancing cost and performance, the new alloy 'NIO-2' was released to the vehicle project to ensure its stability and reliability in practical applications."

Regarding the application range of the new alloy, Dr. Huachu Liu, principal researcher of the MRA team, said, "The new alloy 'NIO-2' is based on an aluminum-silicon alloy system, and the chemical composition is carefully adjusted through high-flux thermodynamic simulation. After repeated trial production in the die casting workshop, this material has proved to be suitable for the manufacture of large and giant castings, such as rear floors, battery casings and other parts, and can meet the demand for high-strength and lightweight parts in automotive manufacturing."

In the process of independent research and development of the new alloy "NIO-2", NIO has received strong support from alloy manufacturer Shuai Yichi, high pressure foundry Wencan and Hui Han and other partners. The parties worked closely together to give full play to their respective advantages in material research and development, manufacturing and process technology, and jointly promoted the smooth transformation of the "NIO-2" new alloy from the laboratory to mass production applications. In the future, with the promotion and application of "NIO-2" new alloy in the industry, it is expected to attract more enterprises to devote themselves to the research and development and innovation of automotive materials, and jointly promote China's automotive industry to a higher level in global competition. ■

"NIO-2" 新合金的研发和验证工作由蔚来材料研究与应用研究室团队（以下简称：MRA）负责。在应用到白车身制造前，MRA 团队联合设计、制造、工业化等多部门，历经试样级别、组件级别和车辆级别的三级严格验证流程。MRA 团队负责人 Gary Hughes 表示：“我们严格把关验证项目，尤其是完善的三级验证流程，以确保数据可靠，这是蔚来一以贯之的标准做法。在平衡成本和性能表现后，才将新合金‘NIO-2’释放给整车项目，确保其在实际应用中的稳定性和可靠性。”

针对新合金的应用范围，MRA 团队主要研究员刘华初博士介绍称，“新合金‘NIO-2’基于铝硅合金系统，通过高通量热力学模拟精心调整化学成分。在压铸车间经过反复试制后，证明此材料适用于制造大型、巨型铸件，如后地板、电池外壳等部位，能够满足汽车制造中对高强度、轻量化部件的需求。”

蔚来自主研发新合金“NIO-2”的过程中，得到了合金制造商帅翼驰、高压铸造商文灿和辉哈等合作伙伴的大力支持。各方紧密协作，充分发挥各自在材料研发、生产制造和工艺技术等方面的优势，共同推动了“NIO-2”新合金从实验室到量产应用的顺利转化。未来，随着“NIO-2”新合金在行业内的推广应用，有望吸引更多企业投身于汽车材料研发和创新，共同推动中国汽车行业在全球竞争中迈向更高水平。 ■

Xinan Technology (Thailand) Production Base Begins Construction

锡南科技（泰国）生产基地动工奠基

On January 5, 2025, Xinan Technology (Thailand) Co., Ltd. held a ground-breaking ceremony in Zone 2 of Thailand-China Rayong Industrial Park, Thailand. As an important step in the global strategic layout of Wuxi Xinan Technology Co., LTD. (referred to as: Xinan Technology), through the layout in Thailand, Xinan Technology will be able to better serve international customers and enhance the company's international competitiveness.

In order to meet the needs of business expansion and

2025 年 1 月 5 日，锡南科技（泰国）有限公司在泰国泰中罗勇工业园二区举行动土奠基仪式。作为无锡锡南科技股份有限公司（简称：锡南科技）全球战略布局的重要一步，通过在泰国的布局，锡南科技将能够更好地服务国际客户，提升公司的国际竞争力。

为了满足业务扩展的需求并完善全球战略布局，锡南科

improve the global strategic layout, Xinan Technology signed a joint venture agreement with its wholly-owned subsidiary Wuxi Kasiting Materials Co., Ltd. in 2024 to jointly set up a new joint venture in Thailand to undertake the construction and operation of the Thai plant. The total investment of the entire Thailand plant project is expected to be US \$68 million (or equivalent in foreign currency), involving the establishment of the company, land acquisition, facility construction and equipment procurement. The Thai company will focus on the research, development, production and sales of aluminum alloy products.

Xinan Technology stressed that the investment in the construction of the plant in Thailand is an important step in the company's business development strategy and to improve its global presence. This move will help the company to further expand overseas markets, meet the needs of international customers, and enhance its product supply capacity in the global market.

Since its establishment in 1994, Xinan Technology has always focused on the field of automotive lightweight aluminum alloy parts, the main business covers the production of turbocharger compressor shell components, and is committed to the research and development of precision parts such as electric motors and transmission shells of new energy vehicles. The company has a variety of advanced processes in aluminum alloy molding, such as gravity casting, low pressure casting and die casting. ■

技于 2024 年与其全资子公司无锡卡斯汀材料有限公司签订了《合资协议》，共同在泰国设立了新的合资企业，承担泰国工厂的建设和运营工作。整个泰国工厂项目的总投资额预计为 6800 万美元（或等值外币），涉及公司设立、土地收购、设施建设及设备采购等多个方面。泰国公司将专注于铝合金产品的研究、开发、生产和销售。

锡南科技强调，在泰国投资建设工厂是公司基于业务发展战略和完善全球布局的重要一步。此举将有助于公司进一步拓展海外市场，满足国际客户的需求，并提升在全球市场的产品供应能力。

锡南科技自 1994 年成立以来，始终专注于汽车轻量化铝合金零部件领域，主要业务涵盖涡轮增压器压气机壳组件的生产，并致力于新能源汽车电机、变速箱壳体等精密零部件的研发。公司在铝合金成型方面拥有重力铸造、低压铸造、压铸等多种先进工艺。■

BYD Shenshan Factory Introduces Ultra-large Die-casting Island to Produce Integrated Die-casting Battery Trays

比亚迪深汕工厂引进超大型压铸岛生产一体化压铸电池托盘

Recently, the 9000T and 5000T super large die-casting equipment provided by the Shenshan Production Base of LK Group has been successfully deployed in the new energy vehicle intelligent mold and lamp production of the second phase of Shenshan BYD Automobile Industrial Park.

It is understood that the integrated die casting process has become one of the mainstream technologies in the field of new energy vehicle manufacturing. The 9000T and 5000T die-casting machines are mainly used for the production of integrated die-casting battery tray products, which are key components in the manufacturing of new energy vehicles.

It is reported that in 2024, BYD's investment in Shenshan (Shenzhen-Shantou) Special Cooperation Zone will continue to increase. The company has signed Shenshan BYD Auto

近日，力劲科技集团深汕生产基地所提供的 9000T 级及 5000T 级超大型压铸装备，已成功部署于深汕比亚迪汽车工业园二期的新能源汽车智能模具及车灯项目中。

据了解，一体化压铸工艺已成为新能源汽车制造领域的主流技术之一。此次投入使用的 9000T 级及 5000T 级超大型压铸装备，主要用于生产一体化压铸电池托盘产品，这些产品是新能源汽车制造过程中的关键组件。

据悉，2024 年，比亚迪在深圳市深汕特别合作区的投资力度持续增强。公司先后签约了深汕比亚迪汽车工业园三期、四期项目。目前，深汕比亚迪汽车工业园一期已满负荷

Industrial Park phase III, Phase IV projects. At present, the first phase of Shenshan BYD Park has reached full capacity, the second phase production capacity is gradually increasing, and the third phase project has officially started construction. It is worth mentioning that it is in Shenshan BYD Park that BYD has achieved the production of the world's 10 millionth new energy vehicle. ■

生产，二期产能正在逐步提升，三期项目已正式动工建设。值得一提的是，正是在深汕比亚迪汽车工业园，比亚迪实现了全球第 1000 万辆新能源汽车的下线。■

Lizhong Group and Li Auto Cooperate to Promote the Construction of Circular Aluminum Chain

立中集团和理想汽车携手推进循环铝链建设

On January 8, 2025, Li Auto's First Annual Forum on Climate Change and Carbon Neutrality (2025) was held in Beijing. During the event, Li Auto, in collaboration with Lizhong Group and other strategic partners, officially launched the construction ceremony of the circular aluminum chain. Li Auto is committed to promoting the development and reuse of green materials by advancing the application of aluminum and constructing a circular aluminum chain, addressing the growing annual volume of waste aluminum. Liao Mengjun, Vice President of R&D and Operations at Li Auto, stated, "By positioning itself as the core anchor point, Li Auto systematically integrates waste aluminum sources across its internal R&D, supply, manufacturing, and after-sales processes. Externally, it collaborates with key stakeholders such as aluminum companies, environmental protection firms, dismantling plants, and suppliers to establish five critical links, thereby forming a closed-loop recycling system characterized by dual internal and external circulations."

Lizhong Group has dedicated itself to the recycling of secondary aluminum resources for four decades, consistently advancing its green and sustainable development strategy. The company holds a leading position in the recycling and processing of secondary aluminum. In terms of waste aluminum procurement and sorting, Lizhong Group has established an extensive domestic and international recycling network, creating a dual-circulation industrial layout to ensure a stable supply of waste aluminum raw materials for the company.

On the basis of long-term successful cooperation, both parties will further broaden their collaboration in vehicle

2025 年 1 月 8 日，理想汽车第一届气候变化与碳中和年度论坛（2025）在北京举行。会上，理想汽车与立中集团等合作伙伴共同完成循环铝链的建设启动仪式。

理想汽车积极推动绿色材料的开发与再利用，通过铝材开发与应用和循环铝链建设，应对废铝量逐年增加的现状。理想汽车研发运营副总裁廖孟军表示：“理想汽车以自身为锚点，内部逐步覆盖研发、供应、制造和售后端的废铝来源，外部打通包含铝材公司、环保公司、拆解厂、供应商在内的五个关键链路，形成内外双循环的闭环回收体系”。

立中集团 40 年来始终致力于再生铝资源的循环利用，持续推进绿色、可持续发展战略，公司在再生铝回收、加工等方面具有领先优势。立中集团在废旧铝采购和分选方面已建立起国内国外再生铝回收网络，形成了双循环的产业布局，保障公司拥有充足的废旧铝原料资源。

双方在长期良好的合作基础上，将进一步拓展在整车材料循环方面的合作，充分发挥各自优势，共同扩展可持续循环材料的应用范围，提升同拆解方的合作深度与效率，在现有的拆解、熔炼、加工的模式上，进一步探索整车循环利用的潜在价值点，最大化挖掘整车材料循环的价值增值，实现整车材料循环经济效益。

立中集团通过推进精益生产和数字化、智能化转型，实

material recycling. By leveraging their respective strengths, they will jointly expand the application scope of sustainable recycling materials, enhance the depth and efficiency of cooperation with dismantling partners, and further explore potential value points in vehicle recycling within existing dismantling, melting, and processing modes. This aims to maximize the value appreciation of the entire vehicle material cycle and achieve optimal economic benefits. Through the promotion of lean production and digital intelligent transformation, Lizhong Group achieves green, low-carbon, and sustainable development, fulfills its corporate social responsibility, supports Ideal Automobile's "circular aluminum chain construction," and contributes to steering the automobile industry toward a lower carbon and more sustainable future. (Lizhong Group)

现绿色、低碳、可持续发展，践行企业社会责任，助力理想汽车“循环铝链建设”，为汽车行业迈向更低碳可持续的未来贡献力量。（信息来源：立中合金）■

Haitian Zhisheng Won the Order of 20 Sets of 350T-5000T Diecasting units and Magnesium Alloy Injection Molding Machine from Jiangsu Aitonghua

海天智胜金属获江苏艾通华 20 套 350T-5000T 智能压铸单元设备及镁合金注射成型机订单

On January 20, 2025, Haitian Zhisheng Metal Molding Equipment Co., Ltd. (hereinafter referred to as "Haitian Zhisheng Metal") and Jiangsu Aitonghua Precision Technology Co., Ltd. (hereinafter referred to as "Jiangsu Aitonghua") officially entered into a strategic cooperation agreement.

According to the agreement, Jiangsu Aitonghua will procure 20 units of intelligent die-casting equipment ranging from 350T to 5000T, as well as magnesium alloy injection molding machines from Haitian Zhisheng Metal. This not only signifies a new phase of collaboration between the two parties but also indicates that Aitonghua's production capacity is set to achieve a qualitative leap. With the completion of Aitonghua's new Rudong factory, the company has decided to further deepen its cooperation with Haitian by signing strategic agreements, thereby accelerating its development pace. This collaboration is underpinned by the long-standing trust and successful partnership established between the two entities.

Jiangsu Aitonghua Precision Technology Co., Ltd. is situated

2025 年 1 月 20 日，宁波保税区海天智胜金属成型设备有限公司（简称：海天智胜金属）与江苏艾通华精密科技有限公司（简称：江苏艾通华）正式达成战略合作。

根据协议，江苏艾通华将向海天智胜金属批量购买 20 套 350T-5000T 智能压铸单元设备及镁合金注射成型机。这不仅标志着双方合作迈入新阶段，且预告了艾通华的产能将迎来质的飞跃。

随着艾通华如东新工厂的落成，艾通华决定与海天深化合作，签署战略协议，加速发展步伐。此次合作，正是基于双方长期以来的信任与成功合作的基础。

江苏艾通华精密科技有限公司位于江苏省南通市如东，公司占地面积约 3.5 万平方米，建筑面积 3.8 万平方米，全面建成后具备年生产 20 万吨铝合金压铸件的产能。目前，

in Rudong, Nantong City, Jiangsu Province. The company occupies an area of approximately 35,000 square meters, with a total building area of 38,000 square meters. Currently, it operates over ten Haitian die-casting islands ranging from 350T to 2500T, all of which have achieved fully automated production. Additionally, the company is equipped with nearly 100 units of advanced machinery, including automatic forging equipment, CNC machining centers, intermodulation instruments, and network analyzers, enabling it to offer customers comprehensive one-stop services from initial product development through to mass production. Presently, the first phase of Aitonghua's die-casting production line has reached its standard operational capacity. Moving forward, the second and third production lines are anticipated to incorporate a maximum of 5000T die-casting islands along with approximately 20 magnesium alloy injection molding machines. (Haitian Zhisheng Metal). ■

已拥有十多套海天 350T-2500T 压铸岛，均实现自动化生产。同时配有自动锻压、CNC 加工中心、互调仪、网络分析仪等主要设备约 100 台，可为客户提供从产品初期研发到批量生产一站式服务。目前，艾通华压铸一期产线已具备正常生产能力。接下来，二、三期产线预计追加投入最大 5000T 压铸岛及镁合金注射成型设备共计约 20 台套。（信息来源：海天智胜金属）■

Craftsmanship Forging Excellence, Innovation Driving the Future Zhongxing Metal Shines at METAL CHINA 2025

匠心铸就非凡 创新驱动未来——中兴金属闪耀 2025 铸博会



Shandong Zhongxing Metal Products Co., Ltd. has dedicated decades to the metal abrasives field, integrating research and development, production, sales, and service to provide high-quality shot blasting solutions to clients worldwide. With robust technical expertise, a comprehensive quality

山东中兴金属制品有限公司专注金属磨料领域，集研发、生产、销售与服务于一体，为全球客户提供高质量的喷抛丸整体解决方案。凭借雄厚的技术储备、完善的质量管理体系以及全球化布局，公司在业内享有盛誉。

management system, and a global footprint, the company has earned an esteemed reputation in the industry.

Robust Corporate Strength, Leading Industry Development

Headquartered in Tengzhou, Shandong Province, the company originated as Zhongxing Steel Shot Factory in the early 1980s. Today, it occupies approximately 66,000 square meters and operates four state-of-the-art fully-automated production lines for steel shot and steel grit, achieving an annual capacity of 100,000 tons.

Professional Team: With over a hundred technical and management experts, the company actively engages in industry–university–research collaborations, ensuring leadership in product development, marketing, and manufacturing.

Global Presence: Boasting 16 domestic branches and 45 offices, along with 5 overseas branches, its products are exported to over 50 countries and regions—including Europe, Japan, South Korea, Australia, Brazil, and Mexico—serving more than 5,000 customers.

Authoritative Certifications: Certified under ISO9001 and IATF16949 international standards and strictly adhering to both SAE and ISO standards, the company ensures consistently reliable product quality.

Technological and Product Innovation, Comprehensive Upgrade of Surface Treatment Solutions

Driven by customer needs, Zhongxing Metal continuously advances metal abrasives technology. Its main product portfolio includes alloy steel shot/grit, low-carbon steel shot, cut wire shot, stainless steel shot—seven series encompassing over fifty specifications widely used in the surface treatment for shipbuilding, automobiles, machine tools, steel structures, aerospace, petroleum, and wind power equipment.

Advanced Production Process: Utilizing fully automated melting lines and intelligent particle size screening systems, product hardness, density, and microstructure are precisely controlled. This results in significantly lower breakage rates than industry averages and a lifespan increase of 30%–40%.

Five-Tier Quality Inspection System: From raw material inspection and melting monitoring to forming detection, particle screening, and packaging verification, every step is rigorously



企业实力雄厚，引领行业发展

山东中兴金属制品有限公司总部位于山东省滕州市，前身为中兴钢丸厂，成立于上世纪 80 年代初。公司占地约 6.6 万平方米，拥有四条国内外先进的全自动铸钢丸、铸钢砂生产线，年产能达 10 万吨。

专业团队：现有专业技术与管理人员百余名，深入开展产学研合作，确保在产品研发、市场营销、生产制造等领域保持领先。

全球布局：在国内设 16 家分公司和 45 家办事处，海外建有 5 家分公司，产品远销欧美、日本、韩国、澳洲、巴西、墨西哥等 50 多个国家和地区，服务客户逾 5000 家。

权威认证：通过 ISO9001、IATF16949 等国际标准认证，并严格遵循 SAE、ISO 双重标准，确保产品质量稳定可靠。

技术与产品创新，全面升级表面处理方案

公司坚持以客户需求为导向，持续推进金属磨料技术创新。主要产品包括铸钢丸（砂）、合金钢丸（砂）、低碳钢丸、钢丝切丸、不锈钢丸、研磨丸、新丝预抛切丸等七大系列五十余种规格，广泛应用于船舶、汽车、机床、钢结构、航天、石油、风电设备等领域。

生产工艺先进：搭建全自动熔炼生产线及智能化粒度筛选系统，产品硬度、密度、微观结构精准可控，破碎率显著低于业内平均水平，使用寿命提升 30%–40%。

“五重质检体系”：从原料检验、熔炼监控、成型检测、粒度分选到包装复核，实现全过程管控，出厂合格率达 100%。

controlled to achieve a 100% qualification rate.

Customized Technical Support: Offering comprehensive solutions—including improved shot blasting processes, reduced abrasive consumption, optimized surface treatment quality, and equipment maintenance training—substantially enhances production efficiency and treatment quality.

Win-Win Cooperation, Shaping the Future Together

Upholding the principle of "Quality as the Foundation, Innovation as the Lifeblood, and Customers as the Essence," the company continuously invests in research and expands its global market presence to set new benchmarks for efficient, green, and intelligent surface treatment.

Industry Focus: Concentrating on key topics such as casting, forging, and surface treatment, the company shares cutting-edge technologies and insights with industry experts.

Innovative Launches: It introduces newly upgraded metal abrasives products that deliver longer service life and enhanced efficiency.

Professional Support: A dedicated team will be on hand to provide on-site consultation and equipment maintenance training, driving ongoing advancements in overall solutions.

On May 20-23, 2025, METAL CHINA 2025 in Tianjin Booth S7-B08, Shandong Zhongxing Metal Products Co., Ltd. cordially invites industry professionals and friends from all walks of life to join us. Let us gather in Tianjin to share this grand event and jointly create a brilliant future! ■

定制化技术支持：提供改进喷抛工艺、降低磨料消耗、优化表面处理质量、设备维护培训等全方位解决方案，大幅提高生产效率与处理品质。

信达天下，共塑行业未来

公司始终秉承“品质为基础、信誉为生命、创新为灵魂”的理念，不断加大研发投入和全球市场布局，致力于打造高效、绿色、智能的表面处理新标杆。

行业前沿：聚焦铸造、锻造及表面处理等热点，与专家共享前沿技术。

创新发布：推出全新升级金属磨料产品，实现更长寿命、更高效能。

专业支持：专业团队现场提供咨询与设备维护培训，助力整体解决方案升级。

2025年5月20-23日，天津·中国国际铸造博览会，展位号 S7-B08

山东中兴金属制品有限公司诚邀各界朋友莅临指导，让我们相聚津门，共襄盛举！

website: www.zxabrasives.com ■

Mingzhi Technology —— Deepen Turkey and India Markets Layout to Accelerate Global Casting Industry Growth and Advancement

明志科技：深化土耳其和印度市场布局，推动全球铸造业持续发展和进步

Mingzhi Technology, a world-class producer of high-end core shop equipment for foundries, has officially announced the establishment of a joint venture, "Mingzhi KorTek Makine San ve Tic Ltd Şti" (hereinafter referred to as MTK) in Turkey, as well as the opening of an office and the appointment of technical sales representatives in India. Mingzhi Technology is committed to strengthening its ties with local foundry enterprises in Turkey and India, enhancing localized

近日，明志科技正式对外宣布，在土耳其成立合资公司“Mingzhi KorTek Makine San ve Tic Ltd Şti”（以下简称 MTK），在印度设立办事处并任命技术销售代表。这一举措旨在加强与土耳其和印度当地铸造企业的紧密合作，增强本地化服务，提供高端制芯设备和专业技术服务，更好地服务于快速增长的土耳其和印度铸造市场，以推动明志科技

services, and offering high-end core-making equipment and professional technical support. These initiatives are aimed at better serving the rapidly expanding Turkish and Indian foundry markets, thereby facilitating Mingzhi Technology's rapid growth within the foundry industry in these two countries.

The establishment of the joint venture MTK in Turkey and the setting up of an office in India not only underscores Mingzhi Technology's firm commitment to providing innovative technology products and cutting-edge automation solutions to foundries in these regions, but also reflects its deep concern and long-term strategy for these two markets. Mingzhi Technology's MiCC Integrated Core Making Centre, MiCL Intelligent Core Making Control System, and Precision Core Package Technology (PCP) all enhance core making efficiency and sand core quality, which aligns perfectly with the growing emphasis on efficiency improvement, digital transformation, and environmental responsibility in the foundry industries of Turkey and India.

With over 20 years of industry experience, Mingzhi Technology has production bases both in China and Germany, and has established an extensive network of globe partners. It is widely expected that with the establishment of MTK and the setting up of an office in India, Mingzhi Technology will actively inject new vitality into global foundry enterprises, aiding them in reaching new heights of development and bolstering their competitiveness in today's challenging market.

For more information on Mingzhi Technology, please visit www.mingzhi-tech.eu

For business in Turkey, please contact us at Yilmaz.ozkan@mingzhi-tech.eu

For business in India, please contact us at ramchandra.rakhayy@mingzhi-tech.eu. ■

在这两个市场的快速发展。

土耳其合资公司 MTK 的成立以及印度办事处的设立，不仅彰显了明志科技致力于为土耳其和印度铸造厂提供创新技术产品和尖端自动化解决方案的决心，也体现了公司对这两个市场的高度重视和长远布局。公司的 MiCC 集成制芯中心、MiCL 智能制芯控制系统及精密组芯造型技术（PCP），能显著提升制芯效率和砂芯质量，这与土耳其和印度铸造行业日益重视效率提升、数字化转型以及环境责任的理念不谋而合。

明志科技拥有 20 多年的行业经验，在中国和德国均设有生产基地，并在全球范围内建立了广泛的合作伙伴网络。随着 MTK 的成立和印度办事处的设立，明志科技将为全球铸造企业注入新的活力，助力其实现更高水平的发展，在当今充满挑战的市场中进一步增强竞争力。

欲了解更多明志科技相关信息，请访问 www.mingzhi-tech.com 或通过 marketing@mingzhi-tech.com 与我们联系。■

Suzhou Foundry Machinery will Shine at METAL CHINA 2025

苏铸将亮相 2025 中国国际铸造博览会

1. Company Profile

Suzhou Foundry Machinery Co., Ltd. founded in 1956, is a global supplier in foundry equipment and foundry technology, which its activity focuses on supplying complete foundry solutions covering horizontal flask molding line, core making center, pouring and molten iron transportation in the digital sub industry, spare parts and after-sales service.

In 1962, we developed and produced the first batch of molding machines and core making machines. Adhering to the core philosophy of technology, quality and innovation, SFM has provided foundry equipment to more than 3,000

1. 公司简介

苏铸是国际化的铸造装备和铸造技术供应商，始建于 1956 年，专注于提供整体铸造解决方案，涵盖水平分型有箱造型线、制芯中心、浇注与铁水输送单元、数字化解决方案以及提供备件和售后服务。

1962 年，我们研发并生产了第一批“苏铸”品牌的造型机和制芯机。苏铸坚持以技术、质量和创新为核心理念，已为全球 3000 多家客户提供了一流的铸造装备。



casters and the world

2 Product Introduction

2.1 Automatic Horizontal Flask Molding Line

Since the development of the first molding machine in 1962, SFM has adhered to innovate, and has continuously updated and iterated technology for 60 years, providing modular and combinable molding technology for global casters, providing every molding machine. After selecting the suitable molding technology, inner cavity size of the flask, production efficiency and casting cooling time, SFM provides a complete line of customized solutions.

2.2 Core Making Center

SFM provides global foundries with a complete core-making solution from sand delivery, sand mixing, core making, core picking, core deburring, coating, drying, core storage and delivery.

The core making technology from SFM is applicable to

2. 产品简介

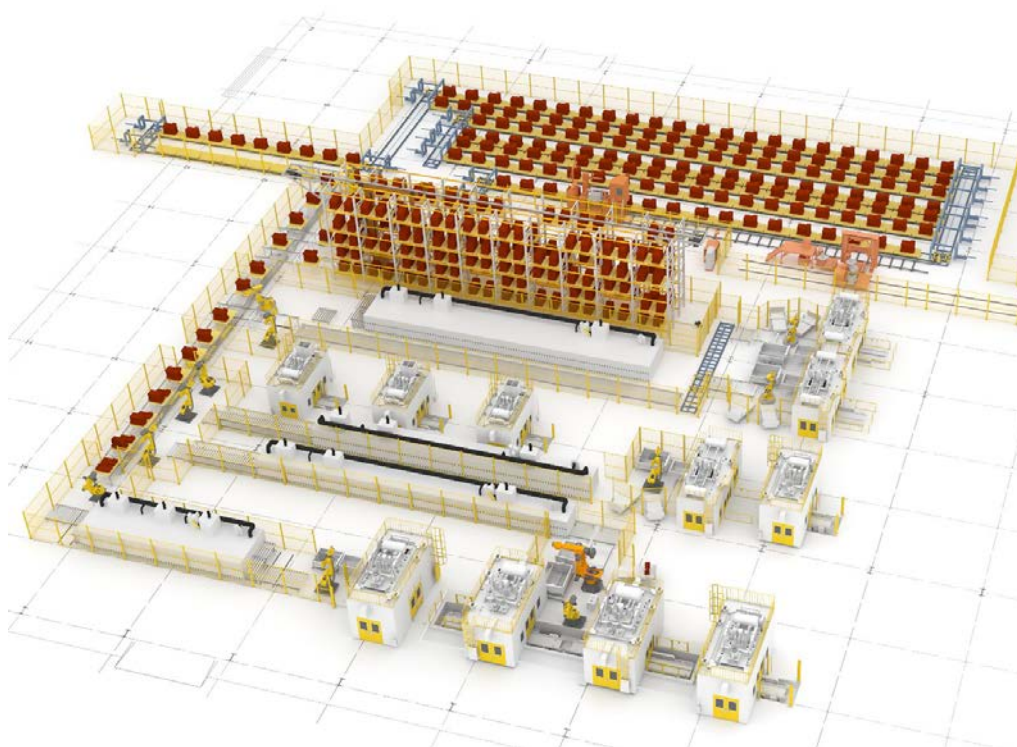
2.1 全自动水平分型有箱造型线

从 1962 年研发第一台造型机后，苏铸坚持以技术创新为核心的发展理念，60 年不间断地技术更新与迭代，为全球用户提供模块化、可组合的造型技术，赋能每一台造型主机。用户可选择合适的造型主机、砂箱内腔尺寸、设计生产效率以及铸件冷却时间后，苏铸提供全线的定制化布线设计。

2.2 制芯中心

苏铸为全球用户提供从原砂发送、混砂、制芯、取芯、修芯、浸涂、表干、砂芯存储到砂芯输送的全流程制芯解决方案。

适用于所有现代铸造工艺，来自苏铸的砂芯制造技术



all mold making processes.

Applicable to various casting processes: core assembly, green sand casting, shell molding, etc.

Matching various core hardening processes: hot box process, cold box process, warm box process.

2.3 Automatic Pouring Machine

The PU series automatic tilting pouring machine is based on the company's "foreseen" control algorithm.

Stable mechanical structure design, precise four-point weighing technology, advanced industrial vision technology and pouring control software are combined to provide customers with reliable and safe pouring solutions.

Add: No.508-4, Zhujiang Rd. Suzhou City, Jiangsu Province, China

Tel: +86 0512

E-mail: yuxl@suzhu.cn

Website: <http://www.suzhu.cn>

适用各类铸造工艺：组芯、潮模砂、低压铸造等
匹配各类砂芯硬化工艺：热芯工艺、冷芯工艺、无机工艺

2.3 全自动浇注机

PU系列全自动倾转式浇注机基于苏铸的“foreseen”控制算法。

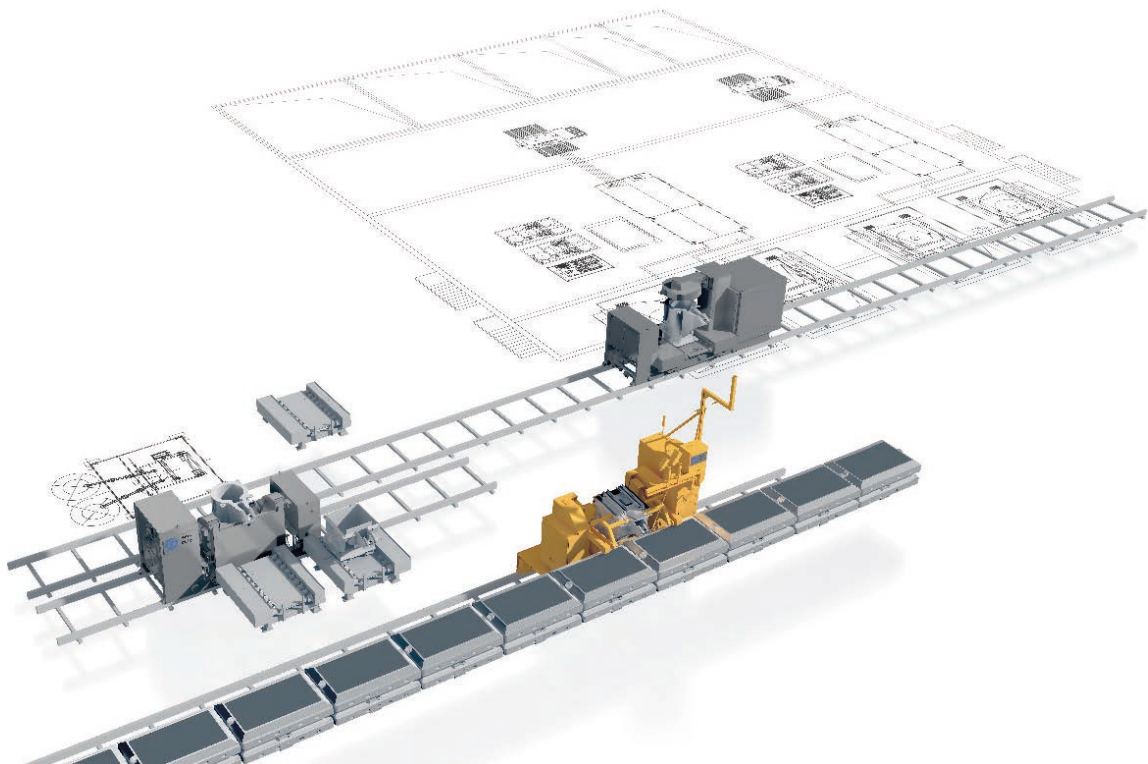
稳定的机械结构设计、精准的四点称重技术、先进的工业视觉技术与浇注控制软件相结合，为客户提供可靠、安全的浇注解决方案。

公司地址：苏州高新区珠江路508-4号

电话 Tel: +86-18896996565

邮箱 E-mail: yuxl@suzhu.cn

网址 Website: <http://www.suzhu.cn>





Insight Into 100 Years of Mixing Technology: A Guided Tour of Gustav Eirich Maschinenfabrik

洞察 100 年历史的混砂技术：参访爱立许机械制造厂

Baden-Württemberg, offered exclusive insights into a century of mixing technology. A special highlight was the visit of the company's own museum. Furthermore, future-oriented topics relating to foundry sand preparation were discussed.

Maria-Luise LIEPE | Sales Western Europe

‘Last year was one of our best years,’ Maria-Luise Liepe reported during a guided tour of the production halls at the company's headquarters in Hardheim. The family-owned company, now in its fifth generation, was celebrating its 160th anniversary last year.

The Eirich mixer: a revolution in the industry

During the tour, Foundry-Planet gained exclusive insights into Gustav Eirich's pioneering mixing techniques, first and foremost the patented ‘Eirich mixer’. It revolutionised the entire industry back in 1906 thanks to its versatility. Today, Gustav Eirich is a globally active group that manufactures machines and systems for mixing technology, granulation/pelletising, drying and fine

巴登 - 符腾堡州，对拥有一个世纪历史的混砂技术企业的独家报道。特别的亮点之一是参观了该公司的博物馆。此外，还讨论了与铸造砂制备有关的面向未来的主题。

在玛丽亚 - 路易斯的带领下参观了公司哈德海姆总部的生产车间，她说：“去年是公司业绩最好的一年。”这家家族企业，现在已经是第五代掌门人，去年庆祝了公司成立 160 周年。

爱立许混砂机：一场工业革命

在参观中，我们获得了对爱立许公司开创性混砂技术的独家见解，首先是专利的“爱立许混砂机”。早在 1906 年，它的多功能性就彻底改变了整个行业。现在，爱立许公司已经成为一个跨国企业，专业提供混砂技术、制粒造球技术、干燥和精细研磨的成套机器和系统。令人印象深刻的是，该公司实现了 80% 的

grinding. Impressive is the vertical range of manufacture of 80 per cent that the company achieves. For decades, Eirich has also been supplying a wide range of industries with sand mixers.

India: A growing market for foundry sand processing

According to Liepe, around 20 to 30 per cent of Eirich sand mixers are destined for the foundry sector. India in particular has developed into an important market: 'India is our focus. The sand mixers used there are entirely manufactured by our sister company EIRICH INDIA PRIVATE LIMITED,' explains Liepe. Similarly, business in China has also developed successfully over the last 20 years. Another growing market segment is Mexico.

Eirich strengthens Germany as a production location

Despite global expansion, Germany remains an important production location for Eirich. With an investment of 5.5 million euros in a new production hall at its main site in Hardheim, the company is making a clear commitment to Germany. The three-storey hall offers 750 m² of optimal production conditions, which can be expanded to 1,210 m² if required. Equipped with a special extraction system, a 10-tonne gantry crane, two 5-tonne cranes and a passenger and goods lift, the hall ensures a smooth flow of materials. A photovoltaic system on the roof rounds off the modern infrastructure.

Focus: modernization, automation and digitalization

According to Liepe, the focus of current production is on modernising existing systems. Automation and digitalisation are also key topics for the future. During the tour of the five production halls and the training workshop (550 employees in Hardheim, including 36 trainees), it became clear how the company successfully combines tradition and innovation.

The MIXEUM EIRICH: A museum for sand mixers

'Wherever you are, between Cameroon and Alaska, we'll build your plant,' was the motto of Paul Eirich, the former Managing Director. His heartfelt project was to build the company's own museum, the 'MIXEUM EIRICH', which gives visitors an insight into the company's history and the development of Eirich sand mixers. The museum is located in one of the historic buildings on the factory premises and documents the history from then until today. ■

垂直制造业务范围。几十年来，爱立许也一直在为各行业提供砂搅拌机。

印度：不断增长的铸造砂市场

据 Liepe 称，大约 20%-30% 的爱立许混砂机用于铸造行业。特别是印度已经发展成为一个重要的市场：“印度是我们关注的重点。这里使用的混砂机完全由我们的姊妹公司爱立许印度私人有限公司提供，” Liepe 解释道，“同样，在过去的 20 年里，我们在中国的业务也获得了成功。另一个不断增长的细分市场是墨西哥。



爱立许增强了德国作为生产基地的地位

尽管在全球不断扩张，德国仍然是爱立许的重要生产基地，并在其位于哈德海姆的主要工厂投资 550 万欧元新建了一个生产车间，这是对德国市场的郑重承诺。这座三层楼高的大厅提供 750 平方米的最佳生产条件，如果需要，可以扩大到 1210 平方米。

大厅配备了一个特殊的抓取系统，一个 10 吨的龙门起重机，两个 5 吨的起重机和一个客货升降机，确保了物料的顺畅流动。屋顶上的光伏系统使现代化的基础设施更加完善。

重点：现代化、自动化和数字化

Liepe 表示，目前公司的重点是对现有系统进行现代化改造。自动化和数字化也是未来的关键主题。在参观了 5 个生产车间和培训车间（在哈德海姆有 550 名员工，其中包括 36 名学员）期间，我清楚地看到了公司是如何成功地将传统与创新结合起来的。

MIXEUM EIRICH：一个混砂机博物馆

“无论你在哪里，从喀麦隆到阿拉斯加，我们都可以为你建造工厂，”这是前总经理保罗·爱立许的座右铭。他用心建成了公司自己的博物馆，“MIXEUM EIRICH”，让游客了解公司的历史和爱立许混砂机的发展。该博物馆位于厂区内的一座历史建筑内，记录了公司发展至今的过程。■

Krapohl-Wirth Foundry Consulting Gmbh Sets the Course for the Future

克拉波尔 - 沃斯铸造咨询有限公司为未来设定路线



Thomas Fritsch, Chief Editor
Thomas Fritsch, 主编



Dr. Hans-Peter Krapohl
汉斯 - 彼得·克拉波尔博士



Wolfgang Wirth
沃尔夫冈·沃斯

Harnessing Industry Expertise and Technical Excellence on a Global Scale

For over two decades, Krapohl-Wirth Foundry Consulting GmbH (KW) has been a trusted partner to the foundry industry. The company supports foundries, casting buyers, and investors worldwide in tackling technical, economic, and environmental challenges. With a strong focus on innovation and industry expertise, KW has played a pivotal role in optimizing processes and enhancing its clients' competitiveness.

In early 2024, KW took a forward-looking step by initiating a generational change in its leadership. This milestone marks not only a new chapter in the company's history but also an opportunity to reflect with the founders, Dr. Hans-Peter Krapohl and Wolfgang Wirth, on KW's development and future perspectives.

Interview with Dr. Hans-Peter Krapohl and Wolfgang Wirth, Founders of Krapohl-Wirth Foundry Consulting GmbH

1. Dr. Krapohl and Mr. Wirth, how has KW evolved since its inception, and where does it stand today?

When we, as the namesakes of KW, founded the company, the foundry industry was facing declining demand and significant cost pressures. Our focus was on creating genuine added value through innovative and flexible approaches. Over the years, we've developed into an internationally recognized consulting firm through technological expertise, deep industry knowledge, and targeted investments in modern tools and methods. Today, we successfully execute global projects aimed at fostering both efficiency and sustainability, which are integral to the planning of new foundry facilities.

在全球范围内利用行业专业知识和卓越技术

20 多年来，克拉波尔 - 沃斯铸造咨询有限公司（KW）一直是铸造行业值得信赖的合作伙伴。该公司为全球的铸造厂、铸造买家和投资者提供支持，以应对技术、经济和环境方面的挑战。凭借对创新和行业专业知识的高度重视，KW 在优化工艺流程和提高客户竞争力方面发挥了关键作用。

2024 年初，KW 迈出了前瞻性的一步，开始了领导层的代际更迭。这一里程碑不仅标志着公司历史的新篇章，也是一个与创始人汉斯 - 彼得·克拉波尔博士和沃尔夫冈·沃斯一起思考 KW 发展和未来前景的机会。

采访克拉波尔 - 沃斯铸造咨询有限公司创始人汉斯 - 彼得·克拉波尔博士和沃尔夫冈·沃斯

1. 克拉波尔博士和沃斯先生，KW 自成立以来是如何发展的，它现在处于什么位置？

当我们以 KW 的名字成立公司时，铸造行业正面临着需求下降和巨大的成本压力。我们的重点是通过创新和灵活的方法创造真正的附加价值。多年来，我们通过技术专长、深厚的行业知识以及对现代工具和方法的有针对性的投资，已经发展成为一家国际公认的咨询公司。今天，我们成功地执行了旨在促进效率和可持续性的全球项目，这是新铸造设施规划中不可或缺的一部分。

2. What sets KW apart, and what strategies have driven your success?

Our strength lies in combining technical excellence, customized solutions, and close collaboration with our clients. We emphasize sustainability and digital transformation to craft future-proof strategies. Key success factors include our profound industry knowledge, our ability to implement innovative technologies in practice, and our relentless commitment to quality. We know how to get things done, leveraging a deep understanding of processes.

3. Which projects stand out in your memory?

One notable example was the modernization of an international foundry site, where we achieved significant energy savings and production increases by employing data-driven analytics and AI tools. Our approach, utilizing flexible production concepts, enabled the client to adapt seamlessly to fluctuating supply chain conditions without sacrificing productivity. These projects highlight how innovative approaches can generate both technical and economic advantages.

A Dynamic Consulting Approach

4. How does KW address current challenges in the industry?

The foundry industry is undergoing profound changes, from digitalization and sustainability requirements to geopolitical uncertainties. Our response is a dynamic consulting approach that combines agility with long-term strategies. We assist our clients in implementing technological innovations such as predictive maintenance, energy-efficient and resource-optimized processes, and CO₂ reduction initiatives.

5. How do you see the future of the foundry industry in Germany and Europe?

The foundry industry will remain highly relevant, particularly in automotive, energy, and machinery sectors. Germany and Europe maintain a competitive edge through quality leadership and innovation. At the same time, new markets are emerging in regions with growing industrial demand. Sustainability, digitalization, and circular economy will be key themes shaping the industry.

This calls for innovative, flexible, and adaptable entrepreneurs willing to implement new technologies—qualities that still abound in Europe. That spirit and speed, which we've seen predominantly in Asia in recent years, need to be reignited in Europe with determination.

6. How is KW currently positioned, and what role will you play in the future?

With the generational change in leadership, KW is optimally positioned for the future. Our 24 employees operate globally, bringing expertise across all process areas. The new leadership team, comprising Jan-Christoph Schwarck, Carsten Engelke, and Andreas Sindel, introduces fresh perspectives and a clear vision. ■

2. 是什么让 KW 与众不同？是什么策略推动了公司的成功？

我们的优势在于结合卓越的技术、定制的解决方案以及与客户密切合作。

我们强调可持续发展和数字化转型，以制定面向未来的战略。关键的成功因素包括我们深厚的行业知识，我们在实践中实施创新技术的能力，以及我们对质量的不懈承诺。我们知道如何利用对流程的深刻理解来完成任务。

3. 哪些项目让你印象深刻？

一个值得注意的例子是国际铸造厂的现代化改造，我们通过采用数据驱动的

分析和人工智能工具，实现了显著的节能和增产。我们的方法，利用灵活的生产

概念，使客户能够无缝地适应波动的供应链条件，而不会牺牲生产力。这个项目

突出了创新方法如何产生技术和经济优势。

动态咨询方法

4. KW 如何应对当前行业面临的挑战？

铸造行业正在经历深刻的变化，从数字化和可持续性要求到地缘政治的不确

定性。我们的应对之策是一种将敏捷性与长期战略相结合的动态咨询方法。我们协助客户实施技术创新，如预测性维护、节能和资源优化流程以及减少 CO₂ 的举措。

5. 您如何看待德国和欧洲铸造业的未来？

铸造行业仍将保持高度相关性，特别是在汽车、能源和机械领域。德国和欧洲通过质量引领和创新保持竞争优势。与此同时，在工业需求不断增长的地区，新的市场也在不断涌现。可持续性、数字化和循环经济将成为塑造该行业的关键主题。这需要创新、灵活和适应性强的企业家，他们愿意实施新技术——这些品质在欧洲仍然是主流。近年来我们主要在亚洲看到的这种创新精神和速度，需要在欧洲以坚定的决心重新点燃。

6. KW 目前的定位是怎样的，你将来会扮演什么角色？

随着领导层的代际更迭，KW 正处于面向未来的最佳位置。我们的 24 名员工遍布全球，为所有流程领域带来专业知识。新的领导团队由 Jan-Christoph Schwarck、Carsten Engelke 和 Andreas Sindel 组成，他们带来了全新的视角和清晰的愿景。■

Self-Reliance as a Trailblazer: How Fritz Winter Tackles Today's Challenges

自强不息 开拓进取：Fritz Winter 铸造公司 如何应对当今的挑战

What Does "Fritz Winter eco solutions" Stand For?

"Fritz Winter eco solutions" represents a comprehensive initiative by Fritz Winter Eisengießerei GmbH & Co. KG, focusing on sustainable production processes and environmentally friendly products within the foundry sector. The goal is to significantly reduce the CO₂ footprint and resource consumption in the industry. Key measures include energy-efficient production methods, reduced reliance on fossil fuels, and targeted emissions reductions. With eco solutions, Fritz Winter embraces a holistic sustainability strategy that integrates ecological and economic considerations, driving long-term sustainable development.

To support this vision, the company launched its largest investment program to date, securing a syndicated loan of approximately €300 million. This financial move aims to strengthen the company's future direction, with a primary focus on environmentally friendly solutions in iron casting.

Central to Fritz Winter's strategy are innovative eco

“Fritz Winter 公司的生态解决方案”代表什么？

“Fritz Winter 铸造公司的生态解决方案”代表了 Fritz Winter 公司的一项全面倡议，专注于铸造行业的可持续生产过程和环保产品。目标是显著减少 CO₂ 足迹和资源消耗。关键措施包括节能生产方法、减少对化石燃料的依赖以及有针对性的减排。凭借生态解决方案，Fritz Winter 公司采用综合生态和经济性的整体可持续发展战略，推动长期发展。

为了实现这一愿景，公司启动了迄今为止规模最大的投资计划，获得了约 3 亿欧元的贷款。这一举措旨在强化公司的未来发展方向，主要关注铸铁领域的环保解决方案。

Fritz Winter 公司的核心战略是创新的生态解决方案，为铸造行业的生态可持续性设定了新的标准。主要举措包括：

- 生态铸造
- 生态熔炼



solutions that set new standards for ecological sustainability in the foundry industry. Key initiatives include:

- ecoCasting
- ecoMelting
- ecoCoating

Each initiative uniquely contributes to reducing environmental impact.

Writing a New Chapter Instead of Lamenting Challenges

Fritz Winter actively invests in innovation, seeking competitive advantages beyond energy costs or wages—areas where Germany faces international pressure. Instead, the focus lies on energy savings, recycling optimization, and leveraging engineering expertise. During the COVID-19 pandemic, the company conducted a comprehensive industry strategy analysis, critically assessing the traditional "whatever it takes" approach and transitioning to self-driven innovation.

The ecoCasting process, introduced in 2014, exemplifies this innovation. It shifts sand casting for automotive and light commercial vehicle engines entirely to core packages, later expanding to truck engine casings. Supported by advanced casting frames, this process achieves thinner-walled cast parts, functional integration, weight reduction, and significant savings in water and sand consumption, including full sand recycling. A new ecoCasting line is set to launch in 2025.

Decarbonization and Climate Neutrality by 2045 - Investment in Two New Electric Crucible Furnaces

With the vision of being the best foundry for the world, Fritz Winter focuses on holistic solutions rather than quick fixes. Since 2013, the company has complied with reporting obligations under the emissions trading system, forming the foundation for its comprehensive decarbonization strategies.

A key focus has been heat recovery to address the high thermal energy demand in production halls, despite continuous heat generation from melting processes. The company prioritized heat recovery and invited experts for a "concept competition" to develop a holistic approach for future melting operations.

The winning solution features two new electric crucible furnaces with a combined melting capacity of 30 tons, recently inaugurated in the so-called "Cathedral." This facility reduces CO₂ emissions by 43,000 tons and cuts reliance on fossil fuels like coke. Additionally, it ensures the sustainable availability of recycled materials, particularly in light of the evolving raw material landscape in steel production.

Responsibility, Passion for Change, and Excellence

Driven by a deep sense of responsibility toward future generations, Fritz Winter has initiated this sustainable transformation with strong support from its workforce. Discussions with leaders Thomas von Reth, Markus Semmler, and Christoph Helfenbein

生态涂层

每一项举措都有助于减少对环境的影响。

书写新篇章，而不是消极应对挑战

Fritz Winter 公司积极投资于创新，寻求超越能源成本或工资等德国面临国际压力的领域的竞争优势。相反，他们的重点在于节能、回收优化和利用工程专业知识。在 2019 年新冠疫情期间，公司进行了全面的行业战略分析，批判性地评估了传统的“不惜一切代价”的方法，并向自我驱动的创新过渡。

2014 年推出的生态铸造工艺就是这一创新的例证。它将汽车和轻型商用车发动机的砂型铸造完全转移到核心业务，随后扩展到卡车发动机外壳。在先进的铸件框架结构的支持下，这一工艺实现了薄壁铸造件、功能集成、重量减轻，并显著节省了水和砂的使用，包括实现了完全的砂回收。一条新的生态铸造生产线将于 2025 年投入使用。

到 2045 年实现脱碳和气候中性——投资新建两座电坩埚炉

以发展成为世界上最好的铸造厂的愿景，Fritz Winter 公司专注于整体解决方案，而不是快速修复。自 2013 年以来，公司一直遵守排放交易体系下的报告义务，为其全面脱碳战略奠定了基础。

一个重点是热回收，以解决生产厂房的高热能需求，尽管熔融过程持续产生热量。该公司优先考虑热回收，并邀请专家进行“创意竞赛”，为未来的熔炼操作开发整体方案。

获胜的解决方案包括使用两个新的电坩埚炉，总熔炼能力为 30 吨，最近在所谓的“大教堂”落成。该设施减少了 43000 吨的 CO₂ 排放量，减少了对焦炭等化石燃料的依赖。此外，它还确保了回收材料的可持续可用性，特别是考虑到钢铁生产中不断变化的原材料格局。

责任、变革的激情和卓越性

出于对子孙后代的强烈责任感，Fritz Winter 公司在员工的大力支持下启动了这一可持续转型。公司领导 Thomas von Reth, Markus Semmler 和 Christoph Helfenbein 强调了这种精神已植根于公司文化，塑造了公司的行动以及那些对变革和卓越追求有着同样热情的人的合作关系。

关于 Fritz Winter

Fritz Winter 公司总部位于德国 Stadtlendorf，是全

underscore how deeply this spirit is embedded in the company's culture, shaping its actions and partnerships with those who share the same passion for change and excellence.

About Fritz Winter

Fritz Winter Eisengießerei GmbH & Co. KG, headquartered in Stadtallendorf, Germany, is a global leader in iron casting. Founded in 1951, the company has become one of Europe's premier foundries, specializing in the automotive and mechanical engineering industries.

Fritz Winter's core expertise lies in producing components made of grey cast iron and ductile iron. Its product range includes brake components, engine parts, and transmission housings used in vehicles from renowned global automakers. Notably, 100% of the raw materials used in production are recycled scrap, underscoring the company's commitment to sustainability and energy efficiency.

In addition to innovative technologies for improving cast component properties, Fritz Winter invests in digital production processes and automation to further enhance efficiency and quality. The company operates modern facilities designed for energy-efficient and resource-saving production, with a strong emphasis on reducing CO₂ emissions.

Fritz Winter's dedication to quality, innovation, and environmental responsibility makes it a trusted partner in the automotive industry and beyond. ■

球铸铁领域的领导者。该公司成立于 1951 年，现已成为欧洲首屈一指的铸造厂之一，专门从事汽车和机械工程行业。

Fritz Winter 公司的核心专长在于生产由灰口铸铁和球墨铸铁制成的部件。其产品范围包括制动部件、发动机部件和变速箱外壳，用于全球知名汽车制造商的车辆。值得注意的是，生产中使用的原材料 100% 是回收材料，强调了公司对可持续发展和能源效率的承诺。

除了改善铸件性能的创新技术外，Fritz Winter 公司还投资于数字化生产流程和自动化，以进一步提高效率和质量。该公司运营着以节能和资源节约型生产为目的的现代化设施，重点是减少 CO₂ 的排放。

Fritz Winter 公司致力于质量、创新和环境责任，使其成为汽车行业及其他行业值得信赖的合作伙伴。■

Digital Control of the Melting Process is an Absolute Must for Greater Efficiency

熔炼过程的数字化控制是提高效率的必须

The state of melting operations in the metal industry (foundries, iron and steel production, smelting, etc.) is diverse and fragmented. Currently, melting remains one of the least digitized areas in many companies' workflows, offering tremendous potential for productivity improvements.

There are proven and evident solutions

In this whitepaper, RGU provides a comprehensive overview of foundry practices combined with digitization approaches, supported by modern software and hardware, presenting the latest state-of-the-art methods for managing melting operations.

Optimized melting processes, combined with cost-efficient material usage, reduced alloy additions, and shorter melting times, determine how economical a melting operation can be. Efficient support for the melting process, integrated with effective material management and successful energy management systems, is increasingly becoming a critical success factor in metal foundries.

金属行业（铸造厂、钢铁生产、冶炼等）的熔炼操作状态是多样化和多步骤的。目前，熔炼仍然是许多公司工作流程中数字化程度最低的领域之一，在提高生产率方面尚有巨大潜力。

已有经过验证的解决方案

在本白皮书中，RGU 提供了铸造实践的综合概述，结合数字化方法，由现代软件和硬件支持，展示了管理熔化操作的最新的最先进的方法。

优化的熔炼工艺，结合具有成本效益的材料使用，减少合金添加量和缩短熔化时间，确定了熔化操作的经济性。对熔化过程的有效支持，与有效的材料管理和成功的能源管理系统相结合，正日益成为金属铸造厂成功的关键因素。



Foseco Feeder Sleeve And Filter Data Now Available In Esi's Procast Software

福士科给料器套筒和过滤器数据现已在 Esi 的 Procast 软件中可用

FOSECO, the foundry division of Vesuvius, and a world leading supplier of casting consumables, and ESI Group, a part of Keysight Technologies, a world leading providers of software for the simulation and optimisation of casting processes, announce a new cooperation.

Thermo-physical data for the FOSECO feeder sleeve and filtration product ranges are integrated and made available in ESI's ProCAST (& QuikCAST) software. ProCAST, leveraging over three decades of expertise, provides detailed insights into the intricate dynamics of the casting process, empowering foundries to evaluate, validate, and optimize their casting processes, thereby reducing manufacturing costs.

The integration of Foseco's feeder sleeve and filter thermo- physical data into ProCAST enables common customers of Foseco and ESI ProCAST to execute simulation projects more efficiently and confidently. By

世界领先的铸造耗材供应商、维苏威铸造厂福士科和是德科技 (Keysight Technologies) 旗下的 ESI 集团宣布达成一项新的合作协议。是德科技是世界领先的铸造工艺模拟和优化软件供应商。

福士科公司的给料套筒和过滤产品系列的热物理数据集成在 ESI 的 ProCAST (& QuikCAST) 软件中。ProCAST 利用超过 30 年的专业知识, 提供了对铸造过程复杂动态的详细见解, 使铸造厂能够评估、验证和优化其铸造过程, 从而降低制造成本。

将福士科公司的给料套筒和过滤器热物理数据集成到 ProCAST 中, 使 Foseco 和 ESI ProCAST 的普通客户能够更有效、更自信地执行模拟项目。通过将产品特定的材料属性分配给每个给料机和过滤器, 模拟的填充和凝固结果

assigning the product-specific material properties to each feeder and filter, simulated filling & solidification results become more reliable.

This improved accuracy and confidence facilitates faster decision making, leading to better gating and feeding system design, fewer simulation iterations to achieve an optimized casting quality with maximized yield.

Initially focusing on products relevant to Ferrous Foundries in Europe, this integration sets the stage for future expansions, with plans to extend the geographic coverage more widely in subsequent phases. Foseco and ESI Group are committed to providing foundries with cutting-edge solutions that enhance efficiency, optimize processes, and drive innovation in the casting industry.

KEY BENEFITS:

+ **Accurate Simulations:** Foseco and ESI's collaboration integrates Foseco's sleeve & filter data into ProCAST for precise casting process & defect predictions, better decision-making, reducing iterations and enhancing quality with maximized yield.

+ **Efficient Workflow:** Having Foseco's data accessible in ProCAST helps foundries eliminate uncertainty in simulations, and boosts productivity.

+ **Worldwide Impact:** Foseco datasets for products relevant for to Ferrous Foundries in Europe will be available initially, and this collaboration shall pave the way for further regional expansion, and subsequently in other regions of the world. ■

变得更加可靠。

这种提高的准确性和信心有助于更快的决策，从而实现更好的浇注和喂料系统设计，更少的模拟迭代，以实现优化的铸造质量和最大的产量。

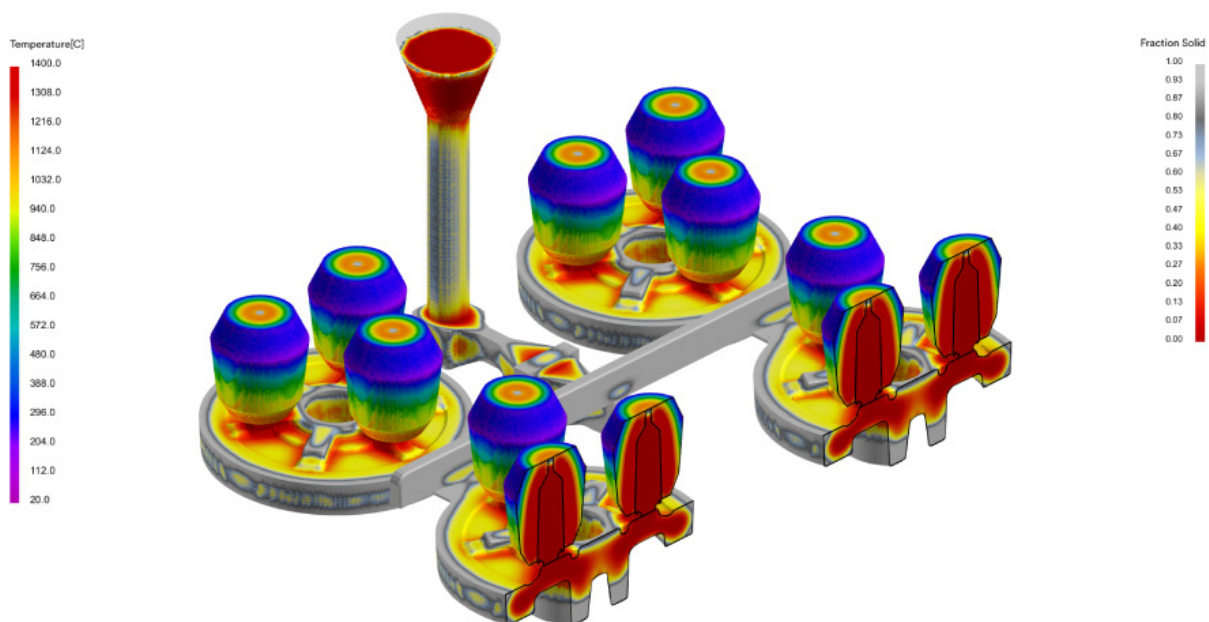
最初专注于与欧洲黑色金属铸造厂相关的产品，这一整合为未来的扩张奠定了基础，并计划在随后的阶段扩大地理覆盖范围。福士科公司和 ESI 集团致力于为铸造厂提供尖端的解决方案，以提高效率、优化工艺，并推动铸造行业的创新。

关键优势：

+ **精确模拟：**福士科公司和 ESI 的合作将福士科的套筒和过滤器数据集成到 ProCAST 中，用于精确的铸造工艺和缺陷预测，更好的决策、减少迭代，提高质量和最大产量。

+ **高效的工作流程：**在 ProCAST 中访问福士科公司的数据有助于铸造厂消除模拟中的不确定性，并提高生产率。

+ **全球影响：**与欧洲黑色金属铸造厂相关的产品的福士科公司数据集将首先提供，这种合作将为进一步的区域扩张铺平道路，随后在世界其他地区。” ■



Streamline Your Grinding Team with Disa Grind Automation

使用迪砂自动化系统优化你的喷砂工艺

DISA, a Norican technology, has launched DISA GRIND, an automated grinding solution specifically designed for foundries. It can finish all alloys, from iron and aluminum to steel, bronze, and copper.

Fast, flexible and incredibly easy to operate, DISA GRIND is perfect for short and medium runs at small and medium-sized foundries.

“In today's job market, it is hard to find employees that want to work in manual grinding,” says Kasper Paw Madsen, Vice President Portfolio Development & Marketing at DISA. “Automated grinding with DISA GRIND is cleaner and safer, so it's much easier to recruit operators and you can train them quickly too. DISA GRIND's output is accurate, consistent and highly productive, with fixtures that are inexpensive and easy to fabricate.”

Easy-to-use auto grinding: productive, consistent and safe

DISA GRIND's fully automated grinding process is simple to understand. Unlike conventional auto grinding equipment, it does not require CNC programming skills. Anyone can quickly learn to program it using its intuitive touchscreen and handheld control box.

“Adjust the dial to accurately position the grinding tool, then simply press the blue button to record its location,” explains Kasper. “It's ideal for foundries that handle short runs with frequent new castings. You need far fewer operators, there's almost no training required, and the work is cleaner and safer, so you can recruit more easily and retain staff longer too.”

Available in two sizes, DISA GRIND can grind castings up to 1200 kg (2,645 lbs). The T-900 handles castings up to 940 mm (37 in) diameter x 400 mm (15.75 in) height and the T-1300 grinds workpieces up to 1340 mm (52.75 in) diameter x 750 mm (29.5 in) height.

Better for your grinding crew, better for your business

DISA GRIND handles small and medium runs equally well, with a pallet-loading option that increases throughput and further cuts labor requirements. Installation is fast too as DISA GRIND requires no special foundation.

Its compact, robust design features auto lubrication and requires very little maintenance, boosting uptime and reducing

诺瑞肯集团旗下的迪砂公司推出了新设备 DISA GRIND，是一款专门为铸造厂设计的自动化喷砂解决方案，可以应用于所有合金，包括铁、铝到钢、青铜、铜。

凭借快速、灵活和令人难以置信的简易操作，DISA GRIND 非常适合中小型铸造厂的中短流程。

迪砂产品组合开发与营销副总裁卡斯珀表示：“在当今的就业市场上，很难找到愿意从事手工喷砂作业的员工。使用 DISA GRIND 的自动喷砂更清洁、更安全，因此更容易招募到工人，也可以快速培训他们。DISA GRIND 的输出是准确的、一致和高效率的，夹具价格低且易于制造。”

易于使用的自动喷砂设备：效率高、一致性好、安全

DISA GRIND 的全自动喷砂过程很容易理解。与传统的自动喷砂设备不同，它不需要 CNC 编程技能。任何人都可以通过其直观的触摸屏和手持控制盒快速学会编程。

“调整表盘以准确定位喷砂工具，然后只需按下蓝色按钮记录其位置，”卡斯珀解释说，“对于处理需要频繁生产的新铸件的短流程铸造厂来说，这是理想的选择。你需要的操作人员要少得多，几乎不需要培训，工作环境更干净、更安全，所以你可以更容易地招聘员工，也可以更好地留住员工。”

有两种尺寸可供选择，DISA GRIND 可以处理高达 1200 公斤 (2,645 磅) 的铸件。T-900 处理铸件高达 940 毫米 (37 英寸) 直径 x 400 毫米 (15.75 英寸) 和 T-1300 喷砂工件高达 1340 毫米 (52.75 英寸) 直径 x 750 毫米 (29.5 英寸)。

喷砂效果越好，公司业务越好

DISA GRIND 具备托盘装载选项、增大容量、进一步减少劳动力需求，适用于中小型生产。DISA GRIND 不需要特殊的基础，安装也很快。

其紧凑、坚固的设计具有自动润滑功能，只需很少的维护，延长了正常运行时间，降低了运营成本。迪砂也为快

operating costs. DISA offers online support for quick remote assistance too.

“DISA GRIND is the machine our customers asked us for,” says Bo Wolff Haugbølle, Vice President OEM Sales at DISA. “It is designed and built by foundry experts, and solves a real foundry problem: ensuring consistently high finishing quality while making it easier to recruit and train staff. DISA GRIND is very easy and low cost to run while delivering higher productivity and fast ROI. Now every foundry can have automated grinding that fits their production.”

About DISA

DISA, a Norican Group technology, develops and manufactures a complete range of metal casting production solutions for the ferrous and non-ferrous foundry industries. Headquartered in Taastrup, Denmark, with a North American facility based in LaGrange Georgia, DISA is the world-leading supplier of complete foundry solutions and services, as well as state-of-the-art green sand moulding equipment.

DISA also offers its class-leading Monitizer digital solutions that support the whole digital journey from data collection to AI-driven casting quality optimization. Monitizer works in all types of foundries and processes, and with any vendor equipment, to deliver serious process improvements – fast. ■

速远程协助提供在线支持。

DISA OEM 销售副总裁 Bo Wolff Haugbølle 表示：

“DISA GRIND 是我们客户需要的机器，它是由铸造专家设计和制造的，解决了一个真正的铸造问题：确保始终如一的高精加工质量，同时使招聘和培训员工变得更容易。DISA GRIND 非常简单，运行成本低，同时提供更高的生产率和快速的投资回报率。现在，每个铸造厂都可以拥有适合其生产的自动化喷砂设备。”

关于迪砂

迪砂是诺瑞肯集团旗下公司，为黑色和有色铸造行业开发和制造全套金属铸造生产解决方案。迪砂公司总部位于丹麦塔斯特卢普，在美国乔治亚州拉格朗日设有北美工厂，是全球领先的铸造解决方案和服务供应商，拥有最先进的潮模砂造型设备。

迪砂还提供行业领先的 Monitizer 数字解决方案，支持从数据收集到人工智能驱动的铸件质量优化的整个数字化工具。Monitizer 适用于所有类型的铸造厂和工艺，以及任何供应商的设备，以实现准确且快速的工艺改进。■



Driving Transformation In The Metal Industry: Challenges, Technologies And Opportunities

推动金属铸造行业转型：挑战、技术和机遇



The transformation in the metal industry towards climate-neutral production processes is one of the major challenges of the coming years.

CEO Till Schreiter talks about the specific requirements for companies in the metal and foundry industry, current technological developments and the role of digitalization. He highlights the solutions ABP Induction already offers today, how hydrogen can contribute to decarbonization and what obstacles still need to be overcome. He also discusses the significance of global market developments and the role of politics.

A key point is that companies that invest in sustainable technologies at an early stage have the best chance of gaining a competitive advantage when they reach the tipping point. Digitalization is proving to be a key enabler for boosting productivity and increasing flexibility. Schreiter is calling for clear political framework conditions, particularly in the area of energy and hydrogen strategy, in order to provide companies with the necessary investment security.

What specific transformation requirements must companies in the metal production and processing sector meet in order to

金属铸造工业向气候中性生产过程的转型是未来几年的主要挑战之一。

首席执行官 Till Schreiter 谈到了金属和铸造行业对公司的具体要求、当前的技术发展以及数字化。他重点介绍了 ABP 感应电炉目前已经提供的解决方案，氢如何为脱碳做出贡献，以及仍需要克服哪些障碍。他还讨论了全球市场发展的重要性和政治的影响。

一个关键点是，在早期阶段投资于可持续技术的公司，在达到临界点时最有可能获得竞争优势。事实证明，数字化是提高生产力和增加灵活性的关键推动者。Schreiter 呼吁制定明确的政治框架条件，特别是在能源和氢战略领域，以便为企业提供必要的投资安全。

为了实现气候中和，金属生产和加工行业的公司必须满足哪些具体的转型要求？

Till Schreiter：金属生产和加工要想实现气候中和，最根本的挑战是只使用不排放 CO₂ 的工艺。如果我们看一

become climate-neutral?

Till Schreiter: The fundamental challenge for metal production and processing in order to become climate-neutral is to only use processes that do not emit CO₂. If we look at the classic processes, we see the blast furnace processes on the crude steel production side and the cupola furnace process in the foundry sector for large-scale production, which is also CO₂-based. At the moment, we have no new options in terms of energy supply, apart from either generating electricity using nuclear power or solar or wind energy; realistically, there are no other options available to us.

What innovations are ABP already contributing here today?

Till Schreiter: Electrification of the cupola furnace process is a standard technology for us at ABP. In terms of scaling, we are currently already seeing very powerful systems that are sufficient for a large proportion of production. We are also working on new technologies for heating steel, such as inductive reheating furnaces or the electrification of burner technology.

How can the use of hydrogen in industrial process heat contribute to decarbonization?

Till Schreiter: In principle, using hydrogen to implement industrial process modifications for decarbonization is certainly a cost-benefit issue if you look at it as a whole. The best conversion value is in the steel industry, because decarbonization can have a major effect on CO₂ savings. However, the question arises as to whether we can even get the necessary hydrogen to Germany. If we consider that a large part of the raw materials we need for steel production are transported by ship anyway, then one might ask the controversial question: wouldn't it make more sense to relocate steel production to the countries that produce the hydrogen and supply the ores anyway?

To what extent do global market developments influence the transformation pressure on metallurgical machinery and plant engineering?

Till Schreiter: Metal industry products are either used in German machine construction or, increasingly, in the German automotive industry. The discussions about the VW Group and the cutting of jobs and sites are currently in the news. This influences the decision as to whether new plants are built in Germany or existing plants are replaced with new technologies.

In Germany, the development prospects are unfortunately not at all clear at present: we have no idea which direction energy prices in Germany should and will take. Why and for what purpose is the German state prepared to guarantee certain electricity prices or the like for German industry? This uncertainty significantly increases the pressure to transform.

What role does metallurgical machinery

下经典工艺，我们会看到粗钢生产方面的高炉工艺和铸造部门大规模生产的冲天炉工艺，这也是基于二氧化碳的。目前，我们在能源供应方面没有新的选择，除了要么利用核能发电，要么利用太阳能或风能发电；现实地说，我们也没有其他选择。

ABP 有哪些创新技术？

Till Schreiter: 冲天炉电气化工艺是我们 ABP 的标准技术，在规模化方面，我们目前已经看到了非常强大的系统，足以满足大部分生产。我们也在研究加热钢材的新技术，比如感应式加热炉或者燃烧器的电气化技术。

工业过程热中氢气的使用如何有助于脱碳？

Till Schreiter: 原则上，如果你从整体上看，使用氢来实现工业过程的脱碳改造肯定是一个成本效益问题。最好的转换价值是在钢铁行业，因为脱碳可以对 CO₂ 的节省产生重大影响。然而，问题来了，我们是否甚至可以把必要的氢气运到德国。如果我们考虑到我们钢铁生产所需的大部分原材料无论如何都是通过船舶运输的，那么有人可能会提出一个有争议的问题：将钢铁生产转移到生产氢气并供应矿石燃料的国家不是更有意义吗？

全球市场的发展在多大程度上影响了冶金机械和工程的转型压力？

Till Schreiter: 金属工业产品要么用于德国机械制造，要么越来越多地用于德国汽车工业。关于大众集团的讨论以及裁员是目前的新闻。这将影响到是在德国建造新工厂还是用新技术取代现有工厂的决定。

在德国，不幸的是，目前的发展前景一点也不明朗：我们不知道德国的能源价格应该和是何走向。德国政府准备为德国工业保障一定的电价或类似的东西，原因何在，目的何在？这种不确定性大大增加了转型的压力。

冶金机械和工厂工程作为金属生产转型的“推动者”，扮演着怎样的角色？

Till Schreiter: 冶金机械和工厂工程必须以客户为导向，以便与客户一起创造最终产品的创新发展，这些生产步骤将留在德国。然而，其他生产工艺正在转移到其他国家——要么在欧洲境内，要么在非欧洲国家。

and plant engineering play as an „enabler“ of the transformation in metal production?

Till Schreiter: Metallurgical machine and plant engineering must look at which production steps in the process must be customer-oriented in order to create new developments of the end products together with the customers. These production steps will remain here in Germany. However, other production steps are being relocated to other countries – either within Europe or to non-European countries.

How can companies in this sector ensure that their technological developments are both environmentally and economically viable?

Till Schreiter: The big question is at what point it is worth converting a system. Customers are currently holding back when there are no government subsidies, as considerable investments would have to be made in decarbonization with increasing energy prices are heading. As long as there is a market for conventional steel and price is the deciding factor, production will continue to be CO₂-intensive.

When the tipping point comes, it comes quickly. In any case, companies should make sure that they prepare for a changeover when they have to replace equipment anyway or when it reaches the end of its service life.

What role does digitalization play in this?

Till Schreiter: Digitalization plays a decisive role. If you are a pioneer in digitalization, you can start now without having to wait for a changeover due to demand or the costs of decarbonization. Digitalization can be used to develop more flexible products that are even more customer-oriented – our experience with this at ABP has been very positive. This is also evident from our projects: Production can be planned much better, energy losses can be reduced, which in turn increases plant availability and competitiveness.

What obstacles need to be overcome in order to accelerate the transition to climate-neutral production processes?

Till Schreiter: The demand on politicians is to create investment protection – through a clearer and more comprehensible energy policy, above all a secure price and energy policy. A clear hydrogen strategy is also needed that pursues realistic goals and makes political decisions that face up to the facts: How much hydrogen is really available for industry in Germany?

In Germany, there is considerable uncertainty regarding future energy prices and the state's willingness to create stable framework conditions for the industry. This uncertainty is one of the biggest obstacles standing in the way of change.

What opportunities arise for companies that

行业如何确保其技术开发既环保又经济可行？

Till Schreiter: 最大的问题是什么时候值得转换一个系统。目前，在没有政府补贴的情况下，客户会有所保留，因为在不知道能源价格走向的情况下，必须在脱碳方面进行大量投资。只要传统钢铁还有市场，价格仍是决定性因素，生产就将继续是二氧化碳密集型的。

当临界点到来时，转变会很快。无论如何，当企业无论如何都要更换设备，或者设备使用寿命即将结束时，企业都应该确保做好转换的准备。

数字化在其中扮演着怎样的角色？

Till Schreiter: 数字化起着决定性的作用。如果你是数字化的先驱，你现在就可以开始，而不必因为需求或脱碳成本而等待转型。数字化可以用来开发更灵活的产品，甚至更以客户为导向——ABP 是非常积极的。我们的项目也证明了这一点：可以更好地规划生产，减少能源损失，从而提高工厂的可用性和竞争力。

为了加速向气候中性生产的过渡，需要克服哪些障碍？

Till Schreiter: 对政治家的要求是投资保护——通过更清晰、更容易理解的能源政策，首先是安全的价格和能源政策。还需要明确的氢战略，追求现实的目标，并做出正视事实的政治决策：德国工业真正可获得多少氢？

在德国，未来能源价格和行业是否愿意为行业创造稳定的框架条件存在相当大的不确定性。这种不确定性是阻碍变革的最大障碍之一。

在早期阶段投资于可持续技术的公司会有什么机会？

Till Schreiter: 在早期阶段投资绿色可持续发展技术的公司将在达到气候中和临界点时受益最大。当临界点到来时，有效生产绿色产品将获得最大的市场份额。而很晚才开始重视这个话题的公司将会落后。这是 ABP 公司深入参与的领域——我们将自己视为“您在零排放道路上的合作伙伴”，因为我们自 2023 年 GIFA 展会以来一直在行业中推广零排放技术。我们的开发应用和专业可以知识可以快速帮助企业推动转型进程。

我的建议是，公司现在应该开始投资，制定一个定期更新的转型计划，以便随时准备转型。这不仅意味着技术规

invest in sustainable technologies at an early stage?

Till Schreiter: Companies that invest in green technologies at an early stage will benefit the most when the tipping point is reached. When the tipping point comes, the company that produces green the fastest and implements it productively will gain the largest market share. Those who only start to deal with the topic then will lag behind. This is where we at ABP are intensively involved – we see ourselves as „your partner on the way to zero emissions“, as we have been promoting it in the industry since GIFA 2023. Our development and application expertise can quickly help companies to drive the transformation process forward.

My recommendation is that companies should start spending money now to have a conversion plan and study in place that is regularly updated so that they are ready to convert at any time. This means not only technical planning, but also financial aspects and possibly cooperation with banks and financing partners. Approval procedures should already be initiated so that you can change over immediately when the time comes. ■

划，还包括财务方面，可能还包括与银行和融资伙伴的合作。审批程序应该优先启动，这样你就可以在时机成熟时立即进行变革和转型。■



DALIAN UNITED MINING CO.,LTD

COMPANY PROFILE

Dalian United Mining Co., Ltd is located in Dalian City which is the Northeast Logistic Center in China. Our company is the one that operates the chrome ore and domestic deep processing. Our company has the warehouses and the workshops respectively in Tianjin, Lianyungang and Dalian. All the geographic advantages facilitate the transportation and communication with all the domestic customers and also for export largely.

Our main businesses are import and export. We import foundry, chemical, metallurgical and refractory chromite sand from S.A. and India. Meantime, we export the finished products by the requirements of our clients to Russia, Japan and South Korea.

COMPANY PROFILE

- 一、Refractory Grade Chromite Sand from Africa
 $\text{Cr}_2\text{O}_3 \geq 46\%$, $\text{SiO}_2 \leq 1\%$ SIZE: AFS 45-50
- 二、Foundry Grade Chromite Sand from South Africa
 $\text{Cr}_2\text{O}_3 \geq 46\%$, $\text{SiO}_2 \leq 1\%$ Size: AFS 40-45
- 三、Chemical Grade Chromite Sand from South Africa
 $\text{Cr}_2\text{O}_3 \geq 46\%$, $\text{SiO}_2 \leq 1\%$ Size: AFS 79-85
- 四、Refractory Grade Chromite Sand from India
 $\text{Cr}_2\text{O}_3 \geq 57\%$, $\text{SiO}_2 \leq 1\%$



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Calderys Launches Expanded Product Range of Fast Dry Refractory Solutions for Improved Dry-out of Industrial Furnaces

凯得力公司推出快干耐火材料解决方案产品系列

Calderys is pleased to announce the launch of CALDE® FD (Fast Dry), a refractory technology that can be used in many industrial applications, offering superior efficiency and reliability for all types of industrial furnaces.

As a leading global provider for industries operating in high temperature conditions, Calderys continuously strives to improve its processes to deliver the best possible solution offering to its customers. In the field of cement-bonded refractory castables, no matter the industrial process, furnace dry-out is a critical challenge due to its duration; one that cannot be ignored. Following the completed installation of refractory lining, furnaces are unusable for up to several days to allow for dry-out, which necessarily halts operations.

Calderys is targeting this directly by expanding its product offering in the CALDE® FD (Fast Dry) range. This solution has been developed to integrate smoothly within the Calderys product range. Crucially, CALDE® FD products provide customers with enhanced reliability, less downtime, streamlined processes and improvements in CO2 reductions. This expanded range was developed in alignment with Calderys' ESG objectives to support customers in their energy transition needs.

Bruno Touzo, Global Vice President, Innovation &

凯得力公司宣布推出 CALDE®FD（快速干燥产品），这是一种可用于多个工业行业的耐火材料技术，为所有类型的工业炉提供卓越的效率和可靠性。

作为全球领先的耐材行业供应商，凯得力不断努力改善其流程，为客户提供更好的解决方案。在水泥耐火材料领域，无论是何工艺过程，由于其持续时间，炉干都是一个关键的挑战，是不容忽视的。在完成耐火衬砌的安装后，炉窑在长达几天的时间内无法使用，以允许干燥，这必然会造成停止作业。

凯得力公司的目标是直接扩大其在 CALDE®FD（快速干燥）系列的产品供应，该解决方案是为了在凯得力产品范围内顺利集成。至关重要的是，CALDE®FD 产品为客户提供了更高的可靠性、更少的停机时间、简化的流程和减少二氧化碳。扩大的产品系列是根据凯得力的环境、社会及管理目标开发的，以支持客户满足能源转型需求。

负责创新与技术的全球副总裁 Bruno Touzo 指出：“与 CALDE®FD 相比，替代方案往往需要额外的组件，或在处

Technology, notes: “Comparative alternatives to CALDE® FD tend to require additional components, or are less robust when handling, or harder to adjust to climate conditions. Our product maintains all the advantages of regular cement-bonded castables, so customers don’t need to adjust their processes to integrate them. Besides, this new solution significantly reduces downtime, which is key for our customers, whatever their markets”

Concrete challenges seen by boilers and incinerators operators and aluminum producers are solved thanks to the Fast Dry technology.

Calderys customers in boilers and incinerators operations are typically utility plants generating power or water supply for municipal grids, as well as waste management factories. Providing these essential services requires arranging alternatives during the non-operational periods of their furnaces.

This will often involve buying back-up power from other suppliers or relying on generators that combust diesel or natural gas.

Understandably, such alternatives can be detrimental for customers, both economically and in terms of their carbon footprint. CALDE® FD mitigates this issue by providing the best technology available and reducing reliance on additional, external solutions. Cement-bonded castables’ inherent sensitivity to rapid change will always require caution, but CALDE® FD products’ robustness cuts down time, allowing customers to quickly return to a fully operational state.

Longer dry-out also means more energy needed. With this new technology and a lining thickness exceeding 100mm, CALDE®FD allows furnace operators to save up to 72 hours to reach a temperature of 1,200°C, helping them save energy during their operations.

In the case of aluminum production, Calderys has had a dedicated refractory line for decades: the ALKON® range. This variety of monolithic refractories has been specially formulated for aluminum contact. Now, the Fast Dry technology can be seamlessly integrated into the ALKON® range.

Previously, fast-drying solutions were limited in their application, not being suitable for installation across all areas of a furnace. Ultimately, the overall furnace dry-out time was constrained to that of non-fast-drying areas. The ALKON® FD range is suitable for installation in every part of the furnace, solving this problem. Calderys can now offer a full service, including heat-up within the span of one product family, while, previously, multiple product ranges would be needed to cover a full furnace.

“We are pleased to demonstrate that ALKON® FD solely provides benefits and marks an important next step in our service offering to aluminum customers: dry-out speeds without refractory performance compromise” Bruno Touzo adds. “ALKON® FD represents a full-service and full furnace offering for our customers, allowing faster handover for less disruption and greater productivity.”

About Calderys

理时不那么稳健，或更难适应气候条件。我们的产品保持了普通水泥粘结浇注料的所有优点，因此客户不需要调整他们的工艺。此外，这个新解决方案大大减少了停机时间，这对我们的客户来说是关键，无论在哪个市场。”

由于快速干燥技术，锅炉和焚烧炉运营商和铝生产商面临的具体挑战得到了解决。

凯得力在锅炉和焚烧厂业务中的客户主要包括为市政电网提供电力或供水的公用事业单位，以及从事废物处理的工厂。这些客户在锅炉非运行期间需要安排替代方案以确保基本服务的持续。这通常涉及从其他供应商购买备用电力，或者依赖于燃烧柴油或天然气的发电机。显而易见的是，这些替代方案可能对客户造成经济负担，并增加其碳足迹。CALDE®FD 通过引入行业领先的先进技术，有效减少了对额外外部解决方案的依赖，从而缓解了这一问题。尽管水泥粘结浇注料对快速变化的环境有固有的敏感性，但 CALDE®FD 产品的卓越稳健性显著缩短了停机时间，使客户能够迅速回归完全运营状态。

更长的干燥时间也意味着需要更多的能源。凭借这项新技术和超过 100mm 的衬里厚度，CALDE®FD 允许熔炉操作人员节省长达 72 小时，以达到 1200° C 的温度，帮助他们在操作过程中节省能源。

在铝生产方面，凯得力公司几十年来一直有专用的耐火材料：ALKON® 系列。这种整体耐火材料是专门为铝的生产而配制的。现在，快速干燥技术可以无缝集成到 ALKON® 系列中。

以前，快速干燥解决方案的应用受到限制，不适合在熔炉的所有区域安装。最终，整个熔炉的干燥时间被限制在非快干区域。ALKON®FD 系列适用于安装在炉的每个部分，解决了这个问题。凯得力现在可以提供全面的服务，包括在一个产品系列范围内加热，而以前，需要多个产品系列来覆盖整个炉子。

Bruno Touzo 补充说：“我们很高兴向大家证明，ALKON®FD 好处是很多的，标志着我们向铝客户提供的服务迈出了重要的一步：在不影响耐火材料性能的情况下，保证干燥速度而不影响耐火表现。ALKON®FD 为我们的客户提供全面的服务和产品，允许更快的转换，减少干扰并提高生产力。”

凯得力公司是全球领先的高温工业解决方案供应商，2023 年实现收入约 16 亿欧元，经调整后的 EBITDA 超过 2.2 亿欧元。该集团专注于为工业设备提供耐火服务，其产

Calderys is a leading global provider for industries operating in high-temperature conditions with 2023 revenue at circa €1.6bn and over €220m of adjusted EBITDA. 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. With a presence in more than 30 countries and a strong footprint in the Americas through the brand HWI (HarbisonWalker International), Calderys' international network of experts ensures an end-to-end offer with tailored services. Drawing on over 150 years of experience, Calderys supports its customers in their energy transition needs. Headquartered in Paris, France, the Group counts 5,800 employees and contractors, and 50 plants on five continents. ■

品组合涵盖广泛的耐火材料、并提供先进的技术解决方案，以优化铸钢、冶金助熔剂及成型工艺的性能。通过 HWI (HarbisonWalker International) 品牌，凯得力公司在 30 多个国家建立了国际专家网络，并在美洲市场拥有显著的业务覆盖，能够为客户提供从咨询到实施的全方位定制化服务。凭借超过 150 年的行业经验，凯得力致力于支持客户应对能源转型带来的挑战与机遇。集团总部设于法国巴黎，全球员工及承包商总数达 5800 人，在五大洲运营着 50 家生产工厂。■

Bühler Supplies Megacasting Solutions for Honda's Electric Vehicle Production Hub

本田电动汽车生产中心引入多套 61000kN 压铸岛生产 IPU 外壳

Carat 610 helps Honda accelerate electric vehicle production.

Swiss technology company Bühler Group has supplied Honda Motor Company Ltd. with their first megacasting solutions. The Japanese automobile manufacturer has invested in multiple Bühler Carat 610 die-casting machines to accelerate electric vehicle (EV) production across its network in North America and meet continued strong customer demand across the region. Honda is using one of the Carat 610 cells in Japan for research and development, and the others will be operated at the Anna Engine Plant, in Anna, Ohio, US.

Honda is investing in growing its EV production operation in North America to strengthen its supply system and its ability to prepare for a continued increase in demand in the region. The company is establishing an EV Hub in Marysville, Ohio, which will begin production of EVs alongside existing internal combustion engines and hybrid powered vehicles this year. This expansion of capabilities in North America supports its vision to make battery-electric and fuel-cell electric vehicles represent 100% of its vehicle sales by 2040.

瑞士科技公司布勒集团为本田汽车公司提供了大型一体化压铸解决方案。这家日本汽车制造商已采购多台布勒 Carat 610 压铸机，以扩大其在北美的电动汽车生产能力，并满足该地区持续强劲的客户需求。本田正在日本使用 Carat 610 进行研发，其他设备将在美国俄亥俄州安娜市的安娜发动机工厂运营。

本田正在扩大其在北美的电动汽车生产业务，以加强其供应系统及其为该地区需求持续增加做好准备的能力。该公司正在俄亥俄州马里斯维尔建立一个电动汽车中心，该中心将于今年开始与现有内燃机和混合动力汽车一起生产电动汽车。北美能力的扩大支持了其到 2040 年使电池电动汽车和燃料电池电动汽车占其汽车销量的 100% 的愿景。

作为这一战略布局的一部分，本田正在安装多台布勒 Carat 610 巨型压铸机（即 61000kN 超大型压铸机），用于铸造其智能动力单元（IPU）的外壳。IPU 外壳将容纳电



As part of this strategic move, Honda is installing several Bühler Carat 610 megacasting machines to cast the cases for its Intelligent Power Units (IPUs). The IPU case will contain the EV battery module and serve as the main frame structure for the floor of Honda and Acura EVs. They will be manufactured at the Anna Engine Plant, then delivered to the EV Hub in Marysville where the battery modules will be installed.

The IPU case is much larger than anything Honda has die cast before. It will be die-cast in two pieces and welded together,” says Honda representative. “In-house production of IPUs is a first for Honda. Bühler is equipped to support Honda in this venture with its experienced process engineers and extensive technological know-how, alongside the advanced Carat 610 die-casting machine, to ensure the successful production of the IPU case.

Establishing expertise

We have a long history with Honda, and with the Carat 610, we are very pleased to provide them with a solution to realize their megacasting ambitions,” says Cornel Mendler, Managing Director Die Casting at Bühler. “Our Carat series is the most successful solution on the market and is driving forward megacasting production across the world. Together with Honda, we have installed our megacasting solution in Japan. It was the first of its kind in the country.

The Carat 610 was commissioned in March 2024 at Honda’s site in Tochigi, Japan. This cell is being used for research and development (R&D). Honda is conducting controlled experiments under different casting conditions to

电动汽车电池模块，并作为本田和其讴歌品牌电动汽车地板的主要框架结构。这些外壳将在安娜发动机工厂制造，然后运往马里斯维尔的电动汽车中心进行电池模块的安装。

“IPU 外壳比本田之前压铸的任何部件都要大得多。它将被分成两部分压铸，然后焊接在一起。”本田代表表示，“IPU 的内部生产对本田来说是第一次。布勒凭借其经验丰富的工艺工程师、广泛的技术知识以及先进的 Carat 610 压铸机，能够支持本田在这一领域的尝试，确保 IPU 外壳的成功生产。”

建立专业合作

“我们与本田有着长期的合作关系，凭借 Carat 610，我们非常高兴能够为本田提供实现其巨型压铸雄心壮志的解决方案。”布勒压铸业务董事总经理 Cornel Mendler 表示，“我们的 Carat 系列是市场上最成功的解决方案，并正在推动全球一体化压铸生产的发展。我们与本田一起在日本安装了我们的巨型压铸解决方案，这是日本首个此类项目。”

2024 年 3 月，Carat 610 在本田位于日本栃木县的工厂投入使用。该生产线被用于研发工作。本田正在不同铸造条件下进行受控实验，以确保并提高其最终产品的质量。

“诸如铸造温度、压力、铸造速度和冷却速率等多个参数

ensure and improve the quality of their end products. “Several parameters such as the casting temperature, the pressure, the casting speed, and the cooling rate can be varied in order to examine their effects on the properties of the parts,” says Cornel Mendler.

The use of various fully-automated peripheral devices, such as spray robots for applying release agents, removal robots for lifting the parts from the molds, trimming presses for removing casting flashes and the cooling basin for regulating cooling processes, enables precise control of the entire casting process and helps to achieve reproducible results. “The R&D cell makes it possible to test process innovations and newly developed parts quickly and efficiently. This rigorous testing allows us to optimize our processes,” says Honda representative. “The expertise and experience that we gain in Japan will be shared across our production network in North America to support our electrified future.”

The first Carat 610 cells have already been installed at Honda’s Anna Engine Plant and production is ramping up. “This project is a global cooperation between our teams in Japan and the US,” says Cornel Mendler. “Thanks to our worldwide setup, we are able to work closely with our customers and supply them with the technologies and solutions they need for success in the changing automotive landscape.”

A groundbreaking technology

Bühler has been active in die casting for nearly 100 years and the Carat series is Bühler’s answer to the globally accelerating trend towards larger structural castings in modern car architectures. The two-platen technology with die locking forces of 10,500 to 92,000 kilonewton (kN) is specifically designed to produce large and complex parts.

Megacastings reduce complexity in production by enabling between 70 to 100 parts to be replaced by a single die-cast part. These single-piece castings will generally be produced close to the automotive assembly line, allowing for better integration and reduced transport.

Bühler has manufacturing sites for the construction of its Carat machines in Europe, the US, and China. This unique setup enables the company to produce regionally and to be close to its customers. With more than 900 machines in operation, Bühler’s Carat series is the most successful solution on the market. ■

都可以进行调整，以研究它们对部件性能的影响。” Cornel Mendler 说。

使用各种全自动化辅助设备，例如用于喷涂脱模剂的喷涂机器人、用于从模具中提起部件的移除机器人、用于去除铸造毛边的修边机以及用于调节冷却过程的冷却槽，能够对整个铸造过程进行精确控制，并有助于实现可重复的结果。“研发生产线使我们能够快速高效地测试工艺创新和新开发的部件。这种严格的测试使我们能够优化我们的工艺。”本田代表表示，“我们在日本积累的专业知识和经验将被分享到我们在北美的生产网络中，以支持我们的电动化未来。”

首批 Carat 610 生产线已经在本田的安娜发动机工厂安装完毕，生产正在逐步加速。“这个项目是我们在日本和美国的团队之间的全球合作。” Cornel Mendler 表示，“得益于我们全球的布局，我们能够与客户紧密合作，并为他们提供在不断变化的汽车领域取得成功所需的技术和解决方案。”

开创性技术

布勒在压铸领域拥有近 100 年的历史，Carat 系列是布勒对全球加速向现代汽车架构中更大结构铸件趋势的回应。该系列采用双板技术，模具锁定力为 10 500 至 92 000kN，专门用于生产大型和复杂部件。

巨型铸造通过将 70 至 100 个部件替换为一个压铸部件，降低了生产复杂性。这些单件铸造通常将在靠近汽车装配线的地方生产，从而实现更好的集成和减少运输。

布勒在欧洲、美国和中国设有 Carat 机器的制造基地。这种独特的布局使公司能够实现区域生产，并靠近客户。目前，布勒的 Carat 系列已有超过 900 台机器在运行，是市场上最成功的解决方案。■

FERRARI FOREVER

永远的法拉利

‘There are two religions in Italy. There’s the Catholic Church and there’s Ferrari.’

We arrive a few days before Lewis Hamilton will burn rubber on the '70s tracks in Maranello. Naturally, the Scuderia Ferrari hopes he will be their next legend. The Ferrari complex is truly like nothing we have ever experienced. As we stroll through the Ferrari Citadel, we are met with consistent elements of surprise and design genius. Two robots, lovingly named Romeo and Juliet, exchange rings as part of the composition of a V8 engine. A jungle blooms amidst silver industrials for the workers' well-being. The factory shines both glossy and futuristic, as cars rotate over our heads.

‘Here the soul enters the body,’ someone tells us as we watch a vehicle’s engine carefully being raised into its housing.

There is a level of perfection that seems to border on divinity. It feels a little like standing in God’s workshop as he is putting a human together.

Indeed, Enzo Ferrari himself wasn’t shy to put human elements into his cars. The founder, who saw the car and driver as one organism, often had heady conversations with his Formula 1 drivers. Michael Schumacher’s and Niki Lauda’s ‘feeling’ of the car was then integrated into the design. Their essences now live on in the cars.

‘You can feel the spirit of Enzo Ferrari,’ someone tells us as employees bustle around coffee like a F1 pitstop.

Certainly, there is something that can be felt. When an insatiable strive for perfection and passion, meets artistic vision, it curiously creates something immaterial, invisible yet tangible and alive. It’s like a soul is created that runs like lifeblood through Ferrari. Perhaps, this is the myth of Ferrari.

Now, this myth enters a new epoch. We met with three Ferrari chiefs, Paolo Molinari (head of powertrain manufacturing), Franco Pinna (head of technology and innovation), and Giacomo Lorenzin (head of foundry and machining technologies), who told us all about the next chapters of the legend.

So, what does the future hold for Ferrari? Particularly, regarding the EU’s combustion engine ban in 2035.

‘The classic Ferrari customer can expect that he can buy a Ferrari ICE until 2035,’ the team shares.

Like Ferrari declared on its investor day, it will continue its



Thomas Fritsch, Chief Editor



Sarah Praetorius, International Editor

“意大利有两种宗教，一个是天主教会、一个是法拉利。”

我们到达的几天后，刘易斯·汉密尔顿将在马拉内洛的 70 年代赛道上比赛。当然，法拉利希望他成为下一个传奇。当我们漫步在法拉利城堡时，我们遇到了一如既往的惊喜和设计天才给予的震撼。两个被亲切地命名为罗密欧和朱丽叶的机器人交换戒指，作为 V8 引擎组成的一部分。为了员工的福祉，厂区位于丛林的环境中。当汽车在我们头顶上旋转时，工厂既光彩照人又充满未来感。

当我们目睹一辆汽车的引擎被小心翼翼地吊装进车体时，有人向我们解释道，这就像灵魂在此刻注入了躯体。这一过程展现了一种接近神圣的完美，仿佛置身于造物主的工作间，见证着生命的组装。实际上，恩佐·法拉利本人并不避讳将人性元素融入他的赛车之中。这位创始人始终将汽车与车手视为一个有机整体，并经常与其一级方程式车手展开富有启发性的对话。迈克尔·舒马赫和尼基·劳达对赛车“感受”的反馈随后被整合到设计中，这些车手的精髓如今依然体现在法拉利的每一辆车中。“你可以感受到恩佐·法拉利的精神，”有人对我们说到，此时员工们正在忙碌地喝咖啡，场景宛如 F1 维修站一般高效而专注。

当然，有些事物是可以被感知的。当对完美的不懈追求与激情碰撞上艺术的视觉表达时，它便好奇地创造了一种无形却有形、静止却充满生命力的事物。就像灵魂被赋予生命，如同血液般流淌于法拉利之中。或许，这正是法拉利的传奇所在。如今，这一传奇迈入了新的篇章。我们有幸采访了三位法拉利的核心负责人：动力系统制造负责人 Paolo Molinari、技术和创新负责人 Franco Pinna 以及铸造和加工技术负责人 Giacomo Lorenzin，他们向我们揭示了这一传奇故事的下一阶段。那么，法拉利的未来将如何发展？特别是面对欧盟 2035 年内燃机禁令的问题，该团队表示：“法拉利的忠实客户可以期待在 2035 年之前继续购买搭载



use of hybrids, ICEs, and full electrics as long as possible. ‘We do not believe in one single way to get to the target,’ the team says. The idea is to leave no stone unturned.

‘We will continue on this path of not choosing one technology over the other for our customers. We want them to be able to do so. That doesn’t exclude any technology at the moment, even the ones that are more future-looking.’

A new electric vehicle will soon join the Ferrari family and launch at the end of this year. However, the electric will not replace its other models. Instead, Ferrari sees EVs as one more slice added to its cake.

‘In the end, the important thing is not the power. The important thing is that Ferrari is still Ferrari for our customers. If we manage to build a car that is allegedly, but also in reality a Ferrari, then the problem does not exist.’

‘We like to say different Ferrari for different Ferraristi at different moments,’ the team explains.

However, this is more than just marketing.

‘If you think of our range at the moment, it’s so diverse. It goes from the Roma to the SF90, two completely different worlds, two different types of people, probably also at different moments.’

Some customers prefer to be traditional; some prefer to be greener, others wish to be more performant.

‘But luxury is just that, luxury is about being different. Luxury is about one’s feeling of uniqueness.’

The challenge is serving these needs from the same foundry, the team laughs.

In terms of its foundry, it seems Ferrari has not caught the gigacasting fever yet. While the firm is still evaluating the technology’s possibilities, Pinna says it currently doesn’t see any immediate use for its products.

The foundry has however innovated its power. ‘We are

内燃机的法拉利车型。”

正如法拉利在投资者日所宣布的那样，品牌计划在尽可能长的时间内同时推进混合动力、内燃机（ICE）以及全电动汽车的发展。团队表示：“我们并不认为只有一种途径能够实现目标，而是致力于全力以赴探索多种可能性。”

法拉利将继续沿着这一战略方向前进，为客户提供多样化的技术选择，而非局限于单一选项。这一策略并不排除任何现有或前瞻性的技术。事实上，一款全新的电动汽车即将加入法拉利家族，并预计于今年年底前正式发布。然而，这并不意味着电动汽车将取代其他车型。相反，法拉利视电动汽车为产品组合中的新增亮点，如同蛋糕上的另一块装饰。归根结底，关键并非单纯在于动力性能，而在于确保法拉利始终是客户心目中的法拉利。如果能够成功打造一辆既符合技术趋势又保留法拉利精髓的汽车，那么所有问题都将迎刃而解。团队进一步解释道：“我们希望根据不同客户需求，在不同场景下提供不同的法拉利体验。但这一切并不仅仅停留在营销层面。”

他说，若仔细审视我们当前的经营范围，可以发现其具有高度的多样化特征。从罗马系列到 SF90 系列，这两个产品线代表了两个截然不同的世界，吸引了两种不同类型的客户群体，并且可能在不同时刻满足了客户的多样化偏好——一些客户更倾向于传统设计；另一些则更注重环保性能，还有一些追求更高的效率。“然而，这正是奢侈品的本质所在，奢侈品意味着与众不同。它提供了一种独一无二的情感体验。”团队补充道，真正的挑战在于如何在同一生产

using 100% green energy,' says Molinari. This was an important milestone towards neutrality that the firm had last September. In addition, Ferrari plans to eventually use 100% recycled alloys to reduce their carbon footprint. Ferrari has also adopted an ESG attitude that encourages blue-collar and white-collar staff to find sustainable solutions.

'We're using human resources and human capital to try and get the finish line as soon as possible.'

Looking to the future, Ferrari innovation wants to anticipate needs.

Similar to the advent of the iPhone, Ferrari doesn't want to follow the demands of the crowd but invent new demands for the crowd to chase. Their cars are already very different from what they were 10 years ago. The range now includes a plug-in hybrid, a four-door, and a soft top - technologies and cars that a decade ago were probably unthinkable to Ferrari.

'Now, they're here and they're true Ferraris, we love them. The important thing is to stay true to the DNA - who we are, to continue being recognized as a legend and winner in sports and racing,' he says.

After all, 'Ferrari is forever.'

The Ferrari Foundry in Maranello

The Ferrari foundry in Maranello is an integral part of the production process for Ferrari engines. It plays a key role in the manufacturing of aluminum components used in Ferrari's high-performance engines. Through state-of-the-art technologies and precise manufacturing methods, the foundry ensures the highest quality standards for Ferrari's legendary engines.

Location and Function

· Location: Maranello, Italy, in the heart of the Ferrari headquarters

· Function: Production of essential aluminum components such as cylinder blocks, cylinder heads, and other parts for the famous V12, V8, and V6 engines

Capacity and Resources

- Facility Size: 9,500 m³
- Workforce: 128 skilled workers, including 9 dedicated to quality control and special projects
- Shift Operations: 3 shifts per day for continuous production 5 days a week
- Production Volume: 3,500 tons of aluminum per year
- Material Quality: 100% premium-grade aluminum
- Casting Equipment:
 - 6 fully automated casting cells
 - Sand casting carousel for efficient serial production
 - More than 50 different core types for various engine designs

Casting Processes

The Ferrari foundry utilizes advanced casting technologies to meet the high standards of precision and material quality. The

线上满足这些多元化的需求。在铸造技术方面，尽管全球范围内大型一体化压铸技术正成为热点，但法拉利似乎尚未完全跟进这一趋势。Pinna 指出，公司目前仍在评估该技术的实际应用潜力，但尚未发现其与现有产品之间的直接关联性。然而，法拉利的铸造厂已经在其他领域展现了创新能力。莫利纳里强调，公司已实现 100% 使用绿色能源，这是去年 9 月达成碳中和目标的重要里程碑之一。此外，法拉利计划逐步采用 100% 回收合金以进一步减少碳排放。与此同时，法拉利还积极践行环境、社会及管治（ESG）理念，通过激励全体员工（包括蓝领和技术人员）共同探索可持续发展的解决方案，充分利用人力资源和人力资本，加速实现既定目标。

展望未来，法拉利致力于通过创新来预测市场需求。正如 iPhone 的问世一样，法拉利并不满足于单纯追随消费者的现有需求，而是力求创造全新的需求，引导市场趋势。与十年前相比，法拉利的产品线已发生了显著变化。如今，其系列涵盖了插电式混合动力车型、四门设计以及软顶敞篷等创新技术——这些技术和车型在十年前或许难以想象会成为法拉利的一部分。然而，“如今，它们已成为现实，并且完全符合法拉利的品牌精髓。我们珍视并传承品牌的 DNA，同时确保法拉利在全球范围内继续被视为运动汽车与赛车领域的传奇与领导者。”法拉利相关负责人表示。毕竟，“法拉利代表着永恒的价值。”

马拉内罗的法拉利铸造厂

法拉利位于马拉内罗的铸造厂是其发动机生产流程中不可或缺的重要组成部分。该铸造厂在制造法拉利高性能发动机所使用的铝制组件方面发挥着核心作用。凭借最先进的技术与高度精确的生产工艺，该铸造厂确保了法拉利传奇发动机达到最高质量标准。

位置与功能

- 地点：意大利马拉内洛，位于法拉利总部的核心区域
- 功能：专注于为知名的 V12、V8 及 V6 发动机生产缸体、缸盖等基础铝制部件

产能和资源

- 工厂规模：占地面积达 9500 立方米
- 员工队伍：由 128 名技术娴熟的工人组成，其中 9 人专门负责质量控制和特殊项目管理
- 轮班操作：每周连续生产 5 天，每天实行三班制
- 年产量：年产优质铝材 3500 吨

main processes include:

- Sand Casting
- Gravity Die Casting
- Ferrari is evaluating Low-Pressure Die Casting for future products
- Cold-box Conventional Core Shooting
- 3D Printing for Sand Cores for prototypes

Special Casting Processes for Exclusive Projects

- Hand-mold Foundry: For prototypes and special custom-made components
- Ferrari Classico: Production of parts for historic Ferrari vehicles and restoration projects
- Custom Castings for Formula 1: High-performance components for motorsports applications

Post-Processing and Quality Assurance

To ensure maximum precision and quality, all components undergo additional processing steps after casting:

Heat Treatment

- Optimization of mechanical properties such as strength and durability

CNC Machining

- High-precision milling and machining processes to meet tight tolerances

Quality Control

- Application of advanced inspection methods:
- X-ray inspection to detect casting defects
- Ultrasonic testing for material analysis
- 3D metrology to ensure exact specifications

Technological Innovation

Ferrari continuously invests in research and development to enhance the efficiency and precision of its foundry.

Significance for Ferrari

The foundry plays a crucial role in ensuring the performance and uniqueness of Ferrari engines. By producing key components in-house, Ferrari maintains full control over quality and design. This section describes the competitive technological advantage in the high-performance and motorsport segments. ■

- 材质：采用 100% 高品质铝材

铸造设备

- 6 套全自动铸造单元
- 高效砂型铸造转盘，适用于系列化生产的多种需求
- 提供超过 50 种不同类型的核心组件，以满足各类发动机的设计要求

铸造工艺

法拉利采用先进的铸造技术，以满足精度和材料质量的高标准。主要工艺包括：

- 砂型造
- 重力铸造
- 法拉利正在评估低压压铸
- 冷箱常规砂型打印
- 3D 打印砂芯原型

专属项目专用铸造工艺

- 手工铸造：为原型和特殊定制的组件
- 法拉利 Classico：为历史悠久的法拉利汽车和修复项目生产零部件
- 定制铸造方程式 1：高性能组件的赛车应用

后处理及质量保证

为了确保最高的精度和质量，所有组件在铸造完成后将经历一系列严格的后处理步骤，包括但不限于以下内容：

1. 热处理：优化材料的强度、耐久性及其他机械性能；
2. 数控加工：采用高精度铣削及先进的加工工艺，严格控制公差范围；
3. 质量控制：运用多种尖端检测技术进行全面的质量评估，包括 X 射线检测以识别铸件缺陷、超声波检测以分析材料特性以及三维计量以验证规格准确性。

技术创新

技术创新方面，法拉利持续加大对研发领域的投入，致力于提升铸造厂的生产效率与工艺精度。

重要意义

意义层面，法拉利内部铸造厂在其发动机性能与独特性的保障中扮演着至关重要的角色。通过自主生产关键零部件，法拉利不仅实现了对产品质量与设计细节的全面掌控，还巩固了其在高性能汽车制造及赛车运动领域的技术领先地位。■

Global Impulses for the Metal Industry: Malte Seifert on International Industry Events of the Bright World of Metals and New Paths in Asia

金属工业的全球动力：Malte Seifert 先生关于“璀璨的金属世界”系列展会及亚洲布局

In light of rapid technological upheavals and disruptive developments, “The Bright World of Metals” with the world-leading trade fairs GIFA, METEC, THERMPROCESS and NEWCAST in Düsseldorf, along with their global events, provide a central platform for groundbreaking innovations. They are a reliable partner for the foundry, metallurgy and thermal processing industries, setting impulses for technological progress and sustainable developments in the sector. In conversation with Malte Seifert, Director of The Bright World of Metals, we learn more about the significance of these events and the future perspectives of the industry – particularly in Asia, the economic center of the future.

Mr. Seifert, after a successful Bright World of Metals in June 2023 in Düsseldorf, which impressed with high international participation and innovative technologies from around 2,200 exhibitors from 56 countries, the world-leading trade fairs GIFA, METEC, THERMPROCESS, and NEWCAST, along with their international events, play a key role in the foundry, metallurgy, and thermal processing industries. Looking at the planned events in 2025 and 2026 in Bangkok, Istanbul, Cairo, Riyadh, Shanghai, Jakarta, Mumbai, and Monterrey: What is Messe Düsseldorf’s strategic vision, and in which direction is global growth developing, especially in the Asian markets?

Malte Seifert: The global energy transition, circular economy, skills shortage, artificial intelligence, and innovative production technologies are key topics discussed within the framework of the Bright World of Metals at all our events. A key part of our strategy is strengthening our leadership in the metallurgy and foundry industry while deliberately expanding into growth markets. We are focusing on regions with high economic potential. In recent years, Mexico, Turkey, and Egypt have established themselves as important partners in the



鉴于快速的技术变革和颠覆性发展，“璀璨的金属世界”与世界领先的 GIFA、METEC、THERMPROCESS 和 NEWCAST 贸易展览会在塞尔多夫举行，以及他们的全球活动，为突破性创新提供了一个中心平台。他们是铸造，冶金和热加工行业的可靠合作伙伴，为该行业的技术进

步和可持续发展提供动力。在与璀璨的金属世界总监 Malte Seifert 的对话中，我们了解了这些事件的重要性以及该行业的未来前景 – 特别是在亚洲这个未来的经济中心。

Seifert 先生表示，2023 年 6 月在德国塞尔多夫成功举办了璀璨的金属世界（Bright World of Metals），吸引了来自 56 个国家约 2,200 家参展商的高度国际参与和创新技术，世界领先的贸易展览会 GIFA、METEC、THERMPROCESS 和 NEWCAST 及其国际活动，在铸造、冶金和热加工行业发挥了关键作用。看看计划在 2025 年和 2026 年在曼谷、伊斯坦布尔、开罗、利雅得、上海、雅加达、孟买和蒙特雷举办的活动：展览塞尔多夫公司的战略愿景是什么？全球增长的发展方向是什么，特别是在亚洲市场？

Malte Seifert: 全球能源转型、循环经济、技能短缺、人工智能和创新生产技术是璀璨的金属世界在我们所有活动框架内讨论的关键话题。我们战略的一个关键部分是加强我们在冶金和铸造行业的领导地位，同时有意识地向成长型市场扩张。我们将重点放在具有高经济潜力的地区。近年

fields of infrastructure, energy, and automotive. We also see great potential for our events in Southeast Asia. New business opportunities are emerging for companies in the metal industry in Indonesia and Thailand, for example. With GIFA/METEC Indonesia in Jakarta, GIFA/METEC Southeast Asia in Bangkok, and THERMPROCESS China in Shanghai, we are strategically establishing international industry events in dynamic economic regions. To give a concrete example: at THERMPROCESS China, the demand for high-quality heat treatment technology, instruments and application software in China is increasing year by year.

Thailand's and Indonesia's manufacturing sectors are evolving rapidly, creating demand for sustainable, digital and high-efficiency metal technologies. Green steel, Industry 4.0 and lightweight materials are also among the top investment areas for businesses in the foundry, metallurgy and metalworking industries.

The global economy is undergoing a geopolitical realignment in which Asia is playing an increasingly significant role. What strategic vision does Messe Düsseldorf pursue in this region?

Malte Seifert: Asia is the market of the future. With the economic rise of countries like China and India, as well as the dynamic developments in Southeast Asia, the world is at a turning point. According to the International Monetary Fund, economic growth in Asia will be ten percentage points above the global average between 2024 and 2030. Asia is also becoming increasingly self-sufficient: 58.5 percent of Asian trade takes place within the continent, and this share is set to increase further. Asian imports will increase by 27 percent by 2030, and exports by 34 percent. For companies, this means: those who are not present in Asia risk losing connection to the world's most dynamic growth markets. That is why we are specifically expanding our presence in Asia with our trade fair platforms to facilitate market entry for companies. Our five regional subsidiaries in Singapore, Hong Kong, New Delhi, Tokyo, and Shanghai ensure that we are deeply embedded in Asian markets and can optimally support international companies. One thing is certain: if we want to secure our global leadership position – both as a company and for our home base in Düsseldorf – we must establish a strong presence in Asia. And we are doing so with full

来，墨西哥、土耳其和埃及已成为基础设施、能源和汽车领域的重要合作伙伴。我们也看到了我们在东南亚举办活动的巨大潜力。例如，印度尼西亚和泰国的金属工业公司正在出现新的商业机会。GIFA/METEC 印度尼西亚站在雅加达，GIFA/METEC 东南亚站在曼谷，THERMPROCESS 中国站上海，我们正在经济活力地区战略性地建立国际行业活动。举一个具体的例子：在 THERMPROCESS 中国，中国对高质量热处理技术、仪器和应用软件的需求逐年增加。

泰国和印度尼西亚的制造业正在迅速发展，创造了对可持续、数字化和高效金属技术的需求。绿色钢铁、工业 4.0 和轻量化材料也是铸造、冶金和金属加工行业企业的首选投资领域。

全球经济正在经历一场地缘政治调整，亚洲在其中扮演着越来越重要的角色。杜塞尔多夫展览公司在该地区的战略愿景是什么？

Malte Seifert: 亚洲是未来的市场。随着中国和印度等国经济的崛起，以及东南亚地区的蓬勃发展，世界正处于一个转折点。据国际货币基金组织预测，2024 年至 2030 年间，亚洲经济增速将比全球平均水平高出 10 个百分点。亚洲也在变得越来越自给自足：58.5% 的亚洲贸易发生在亚洲大陆内部，而且这一比例将进一步增加。到 2030 年，亚洲进口将增长 27%，出口将增长 34%。对于企业来说，这意味着：那些没有进入亚洲的企业可能会失去与世界上最具活力的增长市场的联系。这就是为什么我们专门通过展会





commitment.

Not everywhere looks as promising as Asia. How do you think the metallurgy industry can prepare for increasing global uncertainties?

Malte Seifert: The examples of Egypt, Turkey, and Mexico show how companies can strategically position themselves in a global market. In a time of increasing global uncertainties, flexibility and resilience are crucial success factors. We are building strong yet flexible international networks that can withstand future challenges. In doing so, we see ourselves not just as trade fair organizers but as a platform and network that supports our customers on their path to globalization. Despite the economic and political challenges of recent years, international expansion remains a key driver of growth, innovation, and prosperity. We will continue to do everything we can to support our customers and partners in accessing new markets. Only those who are willing to explore new paths and boldly seize the opportunities of globalization will be successful in the long run.

Besides China, other Asian markets are also gaining importance. The Bright World of Metals has expanded its presence in Indonesia and Thailand. What makes these regions so attractive?

Malte Seifert: Southeast Asia is one of the fastest-growing economic regions in the world, with a sharply increasing demand for metallurgical products, particularly in infrastructure, automotive, and renewable energy sectors. Indonesia has a strong industrial base and rich raw material resources,

platform expand our influence in Asia, providing convenience for companies entering the market. We have five regional subsidiaries in Singapore, Hong Kong, New Delhi, Tokyo, and Shanghai to ensure our deep penetration into the Asian market and provide the best support for international companies. One thing is certain: If we want to ensure our global leadership position—whether as a company or our headquarters in Selldorf—we must build a strong influence in Asia. We are fully committed to doing so.

并非所有地方都像亚洲那样充满希望。您认为冶金行业如何为日益增加的全球不确定性做好准备？

Malte Seifert: Egypt, Turkey and Mexico's example shows how companies can strategically position themselves in a充满活力和多样化的全球市场中。在全球不确定性日益增加的时代，灵活性和韧性是至关重要的成功因素。我们正在建设强大而灵活的国际网络，以抵御未来的挑战。在这样做的过程中，我们不仅将自己视为贸易展览会的组织者，而且将自己视为支持客户走向全球化的平台和网络。尽管近年来面临着经济和政治挑战，但国际扩张仍然是增长、创新和繁荣的关键驱动力。我们将继续尽一切努力支持我们的客户和合作伙伴进入新市场。只有那些愿意探索新的道路，大胆抓住全球化机遇的人才会取得长远的成功。

除了中国，其他亚洲市场也变得越来越重要。璀璨的金属世界扩大了在印度尼西亚和泰国的业务。是什么让这些地区如此吸引人呢？

Malte Seifert: 东南亚是世界上经济增长最快的地区

particularly in aluminum and steel, which are crucial for the construction and automotive industries. At the same time, the demand for energy-efficient and sustainable production solutions is growing, making the trade fair particularly attractive for international companies. That is why we are hosting GIFA/METEC Indonesia in Jakarta from September 9–12, 2026. Thailand is a key production location for automotive suppliers and mechanical engineering in Southeast Asia. The trade fair brings international players together with the local industry and provides access to the entire ASEAN market, which is of strategic importance for many companies. The GIFA/METEC Southeast Asia in Bangkok from September 17–19, 2025, is thus another "place to be."

How do companies specifically benefit from these new trade fair formats?

Malte Seifert: Our international trade fairs enable companies to present themselves directly in emerging markets with the aim to make major investments. They gain access to local decision-makers, suppliers, and business partners, which is a crucial advantage, particularly for European and international firms. At the same time, we focus on sustainability and digitalization, so companies can not only enter new sales markets but also present their innovative technologies to a broad professional audience. Another benefit, especially for German companies in thermal processing technology looking to enter the Chinese market: In addition to our support, they receive special participation conditions through the Federal Ministry for Economic Affairs and Climate Protection.

What role do sustainability and the circular economy play at these trade fairs?

Malte Seifert: Sustainability is a core topic across the entire Bright World of Metals platform. Even in Indonesia and Thailand, energy-efficient production processes and emission reductions are central challenges. For instance, Thailand has committed to carbon neutrality by 2050 and net-zero greenhouse gas emissions by 2065, while Indonesia is implementing carbon tax policies and green industrial initiatives to align with global sustainability efforts. Through our ecoMetals campaign, we specifically support innovative companies developing sustainable solutions – whether through CO₂-neutral foundry technology, resource-efficient materials, or circular economy

之一，对冶金产品的需求急剧增加，特别是在基础设施、汽车和可再生能源领域。印尼拥有强大的工业基础和丰富的原材料资源，特别是铝和钢铁，这对建筑和汽车行业至关重要。与此同时，对节能和可持续生产解决方案的需求也在不断增长，这使得该交易会对国际公司尤其具有吸引力。这就是为什么我们于 2026 年 9 月 9 日至 12 日在雅加达举办 GIFA/METEC 印度尼西亚。泰国是东南亚汽车供应商和机械工程的主要生产基地。展会将国际企业与当地行业聚集在一起，并提供进入整个东盟市场的机会，这对许多公司来说具有战略意义。因此，将于 2025 年 9 月 17 日至 19 日在曼谷举行的 GIFA/METEC 东南亚展是另一个“值得去的地方”。

企业具体是如何从这些新的交易会形式中受益的呢？

Malte Seifert: 我们的国际贸易展览会使公司能够直接



接在新兴市场展示自己，而无需进行重大投资。他们可以接触到当地的决策者、供应商和商业伙伴，这是一个至关重要的优势，尤其是对欧洲和国际公司来说。与此同时，我们专注于可持续发展和数字化，因此公司不仅可以进入新的销售市场，还可以向广泛的专业观众展示他们的创新技术。

另一个好处，特别是对于希望进入中国市场的热加工技术领域的德国公司：除了我们的支持外，他们还可以通过联邦经济事务和气候保护部获得特殊的参与条件。

可持续性和循环经济在这些交易会中扮演着怎样的角色？

Malte Seifert: 可持续发展是整个 Bright World of Metals 平台的核心主题。即使在印度尼西亚和泰国，节能生产过程和减排也是主要挑战。例如，泰国承诺到 2050 年实现碳中和，到 2065 年实现温室气体净零排放，而印度尼西亚正在实施碳税政策和绿色工业倡议，以与全球可持续发展努力保持一致。通过我们的 ecoMetals 活动，我们特别支持创新型公司开发可持续解决方案——无论是通过二

concepts. These topics are brought to life at our events through both expert forums and best-practice examples from our exhibitors.

What future trends do you see for the global metal and foundry industry?

Malte Seifert: The industry is undergoing a profound transformation. Three key trends are shaping the future:

1. Decarbonization and Circular Economy – Sustainable production methods are gaining global importance.

2. Automation and Artificial Intelligence – Digital processes are revolutionizing the industry, increasing efficiency and quality.

3. International Networking – Global supply chains are becoming more complex, making direct exchange between international markets increasingly important.

With the expansion to Shanghai, Jakarta, and Bangkok, the Bright World of Metals is systematically expanding its global network and creating new business opportunities for the metal and foundry industry. We are very much looking forward to welcoming our customers from all over the world to the Bright World Metals trade fairs!

We thank Malte Seifert for these fascinating insights! ■

氧化碳中和的铸造技术、资源高效材料还是循环经济概念。在我们的活动中，通过专家论坛和参展商的最佳实践案例，这些主题变得生动起来。

您对全球金属和铸造行业的未来趋势有何看法？

Malte Seifert: 这个行业正在经历一场深刻的变革。三个关键趋势正在塑造未来：

1. 脱碳和循环经济——可持续生产方法在全球越来越重要。

2. 自动化和人工智能——数字化流程正在彻底改变行业，提高效率和质量。

3. 国际联网——全球供应链变得越来越复杂，使得国际市场之间的直接交流变得越来越重要。

随着在上海、雅加达和曼谷的扩展，璀璨的金属世界正在系统地扩展其全球网络，为金属和铸造行业创造新的商机。我们非常期待欢迎来自世界各地的客户参加我们的璀璨的金属世界贸易展览会！

我们感谢 Malte Seifert 的这些引人入胜的见解！ ■

Bradken's Specialty Products Becomes Vulcan Metals

Bradken 北美特种铸件公司被 Vulcan 金属公司收购

Bradken's Specialty Products North America (SPNAM) business has been sold to Los Angeles-based investment firm TerraMar Capital. SPNAM manufactures highly-engineered, large, complex, mission critical castings for customers in defense, specialized industrial, rail and transit markets.

The locations in Tacoma Washington, Atchison Kansas, St. Joseph, Missouri, and London, Ontario are included in the acquisition. Due to the divestiture from Bradken, they have taken the name Vulcan Metals Corp., an AFS Corporate Member. Bradken CEO Sean Winstone said the divestment allowed Bradken to focus on customers in mining and resources, cementing its reputation as the preferred partner for innovative wear solutions for mining equipment.

"While we are transitioning, our management team remains intact and has the full support of our new owner

Bradken 公司旗下北美特种铸件公司 (SPNAM) 业务已出售给洛杉矶的投资公司 TerraMar Capital. SPNAM 为国防、工业、铁路和交通市场的客户制造高度工程化、大型复杂的关键铸件。

其位于华盛顿州塔科马、堪萨斯州艾奇逊、密苏里州圣约瑟夫和安大略省伦敦的工厂都含在收购中。由于从 Bradken 剥离出来，Bradken's Specialty Products North America (SPNAM) 已更名为 Vulcan Metals Corp.，Bradken 首席执行官 Sean Winstone 表示，本次业务剥离使 Bradken 能够专注于采矿和资源领域的客户，巩固其作为采矿设备创新解决方案首选合作伙伴的市场地位。

Vulcan Metals 销售和营销副总裁 Wayne Braun 表

to manage and grow the business,” said Vulcan Metals Vice President of Sales and Marketing Wayne Braun. “With over 100 years, these foundries have served our OEM customers, and we look forward to expanding under unfettered US ownership.”

Vulcan launched a temporary website at www.vulcan-metals.com. ■

示：“虽然我们正在过渡阶段，但我们的管理团队仍保持原来的，并得到新东家的全力支持，以管理和发展业务。100多年来，这些铸造厂一直为我们的 OEM 客户服务，我们期待在不受约束的美国所有权下扩大业务。”

Vulcan 公司推出了一个临时网站 www.vulcan-metals.com。■

Magma to Expand into Mexico

迈格码公司扩大墨西哥业务

AFS Corporate Member MAGMA Foundry Technologies Inc. has announced its expansion to the Monterrey, Mexico region, establishing a branch office to provide services to the Mexican metalcasting industry.

Its newest location, located in San Pedro Garza Garcia, Mexico, is expected to open this quarter. Based on their growing business demands, MAGMA aims to accelerate growth in the Mexican market and strengthen communication by engaging in client initiatives, educating current customers, and building strategic partnerships. ■

美国铸造协会会员企业迈格码铸造技术有限公司宣布扩大其墨西哥市场，将在蒙特雷建立分公司，为墨西哥金属铸造行业提供服务。

它的最新地点位于墨西哥的圣佩德罗加尔萨加西亚，预计将于本季度开业。根据他们不断增长的业务需求，迈格码旨在加速墨西哥市场的增长，并通过参与客户业务，培训现有客户和建立战略合作伙伴关系来加强沟通。■

Waupaca Foundry Named A ‘Vets Ready Employer’

沃帕卡铸造厂被评为“退伍军人准备雇主”

AFS Corporate Member Waupaca Foundry is one of 22 employers statewide recognized as a 2024 Vets Ready Employer by the Wisconsin Department of Workforce Development (DWD) and its Office of Veteran Employment Services (OVES). The annual award recognizes Wisconsin employers that have gone above and beyond to hire and support veterans and their families.

Approximately 10% of the foundry’s workforce are veterans of the armed services, and several team members have been employed while on active duty with the National Guard. The firm employs 3,500 people nationwide.

Waupaca Foundry was awarded a silver certification in the large business category. Employers are rated and awarded based on criteria including the company’s or organization’s support for veterans in the workplace, such as available resources, training,

美国铸造协会会员企业沃帕卡铸造厂是威斯康辛州劳动力发展部 (DWD) 及其退伍军人就业服务办公室 (OVES) 认可的全州 22 家退伍军人雇主之一。这个年度奖项旨在表彰那些在雇佣和支持退伍军人及其家人方面做得更好的威斯康辛州雇主。

铸造厂约有 10% 的员工是武装部队的退伍军人，还有几名团队成员在国民警卫队服役期间受雇。该公司在全国拥有 3500 名员工。

沃帕卡铸造厂在大型企业类别中获得银牌认证。雇主的评级和授予标准包括公司或组织在工作场所对退伍军人的支持，如可用的资源、培训和工作环境；优先招聘退伍

and work environment; hiring practices to prioritize veteran hires; and efforts to connect to the broader veteran community, including military families, service members, and veterans.

“As an Air Force veteran, I understand and appreciate the benefits veterans bring to the workplace,” said CFO Rob Johnson. “At Waupaca Foundry, we are proud to create an environment where service members and their families feel supported and valued. This recognition is a testament to our commitment to providing opportunities for those who have served our country.”

Johnson added that military service brings strong teamwork, discipline, technical skills, accountability, and safety awareness to manufacturing, making veterans reliable and adaptable team members. ■

军人的招聘实践；以及努力与更广泛的退伍军人社区建立联系，包括军人家属、服役人员和退伍军人。

“作为一名空军退伍军人，我理解并感谢退伍军人给工作场所带来的好处，”首席财务官罗布·约翰逊说。“在沃帕卡铸造厂，我们很自豪能够创建一个让服务人员 and 他们的家人感到支持和重视的环境。这种认可证明了我们一直致力于为那些为我们国家服务的人提供机会。”

约翰逊补充说，服兵役为制造业带来了强大的团队合作、纪律、技术技能、责任和安全意识，使退伍军人成为可靠的、适应性强的团队成员。 ■

Kent Foundry To Invest \$10 Million On Expansion

肯特铸造厂投资 1000 万美元扩建

AFS Corporate Member Kent Foundry has received local municipal go-ahead for a \$10- to \$12-million expansion to its Greenville, Michigan, plant. Plans for the project will likely be unveiled in the late first quarter or early second quarter.

On November 19, the Greenville city voted unanimously to approve establishment of an industrial development district for Kent Foundry. Kent Foundry, a manufacturer of gray and ductile iron castings is owned by Canadian-based parent company Canerector Inc. of Toronto. ■

美国铸造协会会员企业肯特铸造厂已获得当地市政批准，对其密歇根州格林维尔工厂进行 1000 万至 1200 万美元的扩建。该项目的计划可能会在第一季度末或第二季度初公布。

2024 年 11 月 19 日，格林维尔市一致投票通过建立肯特铸造厂工业开发区。肯特铸造厂是一家生产灰铸铁和球墨铸铁的公司，由加拿大多伦多的母公司 Canerector 公司所有。 ■

Tinker Omega Joins Sinto America

Tinker Omega 加入新东（美国）公司

Effective January 1, 2025, Tinker Omega Sinto will become a part of the Sinto America Group under Roberts Sinto in Grand Ledge, Michigan—both AFS Corporate Members. At that time, all incoming orders for equipment and parts will be manufactured at Grand Ledge.

Members of the current sales team will continue representing Tinker Omega product lines and spare parts. The company will maintain a sales and engineering office in Springfield, Ohio, after manufacturing has transitioned to Grand Ledge. ■

从 2025 年 1 月 1 日起，Tinker Omega Sinto 将成为密歇根州 Grand Ledge 地区的 Roberts Sinto 旗下新东（美国）集团的一部分，两者都是美国铸造协会会员企业。届时，所有设备和零部件的订单将在大 Grand Ledge 工厂生产。

目前销售团队的成员将继续代表 Tinker Omega 产品线和备件。在生产转移到 Grand Ledge 后，该公司将在俄亥俄州的斯普林菲尔德保留一个销售和工程办公室。 ■



江苏嘉明碳素新材料有限公司

专业生产低硫低氮增碳剂 石墨化石油焦 电极碎 煅烧石油焦 石墨粉 电极糊 还原剂等碳素制品



专业生产铸造用石墨增碳剂大厂——低硫、低氮、低灰！

公司简介

中国石墨增碳剂行业标准起草单位——江苏嘉明碳素新材料有限公司，坐落于江苏省连云港市东海县，是中国增碳剂行业的大型生产企业，年产石墨化石油焦6万吨、石墨电极碎2万吨、低硫煅烧焦4万吨、电极糊3万吨。公司占地190,000余平方米，自有4个重型生产车间、1个大型仓储车间、1个省级实验室和1个新能源材料工程研究中心，连续多年营业额在5亿元人民币以上。

20余年来，公司始终重视产品质量，不断提升产品的技术水平，增强市场竞争力，先后通过ISO9001质量与管理体系认证、ISO14001环境管理体系认证、ISO10012测量管理体系认证、ISO50001能源管理体系认证，GB/T27922商品售后服务五星级认证以及OHSAS18001职业健康安全管理体系认证。

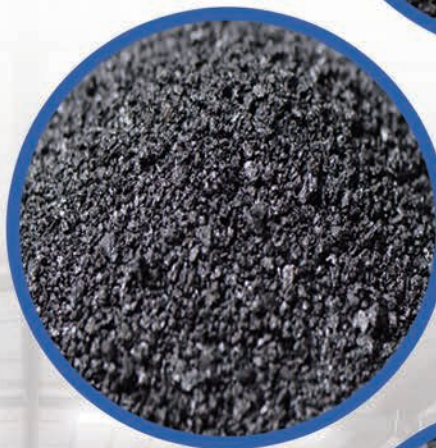
公司始终坚持科技创新，着重研究碳素材料的新技术新产品，拓展应用领域，先后与辽宁工程技术大学、南京工业大学签署长期合作协议，成立了新能源材料工程研究中心、研究生工作站。公司先后取得了38项实用新型专利、8项发明专利，获批国家级高新技术企业、发改委“江苏省碳素新材料工程研究中心”、科技厅“江苏省碳素新材料工程技术研究中心”、工信厅“江苏省专精特新小巨人企业”、工信部“国家级专精特新小巨人企业”等。

嘉明碳素人不忘初心、砥砺前行，以优质的产品、完善的服务回馈社会，20余年来，不仅服务于国内大型钢厂、铸造厂、合金厂，并与新日铁制铁、印度JFE、印度JSW以及韩国、东南亚、欧美等20余国家与地区的客户建立了长期稳定合作关系。热忱欢迎广大国内外新老客户洽谈合作、携手共赢。

石墨化石油焦
粒度：1-5mm



半石墨化石油焦
粒度：0-2mm



石墨电极碎
粒度：5-10mm



孟经理



苗经理

销售热线：13912182520 孟经理 13815601771 苗经理

办公地址：江苏省连云港市东海县科教创业园B栋5楼

工厂地址：连云港东海县青湖镇工业集中区青风路19号

INDIAN FOUNDRY INDUSTRY An Overview

By Amish Panchal

Past President, IIF &

Chairman, National & International Relations Committee-IIF

印度铸造业概况

阿米什·潘恰尔

印度铸造协会前会长、国家和国际关系委员会主席

IIF is a prime association of Indian Foundry Industry representing about 4500 Foundrymen of India.

IIF is celebrating 75 Years of excellence in serving Indian Foundry Industry. This year Presidential theme is “Engineering for a Better Tomorrow”.

World Foundry Industry – At a Glance

- As per the World casting Census published in Jan 2023 by Modern Castings USA, Global Casting Production was estimated at 113.14 million metric tonnes. China, India & USA hold the top three positions.

- World Casting Industry will grow to USD 225.46 Billion in 2030 at CAGR of 5.8%.

Indian Foundry Industry – At a Glance

- India is 2nd largest producer with the casting production of approx. 14.16 Million MT in 2022-23 with an estimated growth of 10-12% in year 2024-25.

- There are approx. 5000 units out of which 90% can be classified as MSMEs.

- Year on year growth rate of Indian Foundry Industry is 10-12%. Industry will grow at 13.89% CAGR during 2023 to 2028. And will be a size of USD 23,706 Million by 2023.

- Total no. of Units (approx.): 5000

- Employment: 2.0 Million (Direct 0.5 Million & Indirect 1.5 Million)

- Revenue: USD 21.0 Billion

- Exports: USD 4.12 Billion (2023-24)

- Types of Casting: India produces almost all types of metal castings such as Grey Iron Casting, Ductile Iron Casting, Steel Casting, Malleable Iron Casting, Aluminium, Copper, Magnesium and Other light metal Castings. Grey iron castings have the major share i.e. approx.

印度铸造协会是印度铸造工业的主要协会之一，拥有约 4500 名铸造工人。印度铸造协会已经成立了 75 年，今年庆祝活动的主题是“铸造更美好的明天”。

世界铸造行业概览

- 根据美国铸造协会 Modern Casting 杂志于 2023 年 1 月发布的世界铸造普查结果，全球铸件产量预计为 1.1314 亿吨。中国、印度和美国位居前三名。

- 到 2030 年，世界铸造业将以 5.8% 的复合年均增长率增长到 2254.6 亿美元。

印度铸造业概览

- 印度是世界上第二大铸件生产国，2022-2023 年的铸件产量约为 1416 万吨，预计 2024-2025 年将增长 10-12%。

- 大约有 5000 家铸造企业，其中 90% 可以归类为微型及中小企业。

- 印度铸造业的年增长率为 10-12%。在 2023 年至 2028 年期间，工业将以 13.89% 的复合年均增长率增长。到 2023 年，其规模达到 237.06 亿美元。

- 铸造企业总数：约 5000 家。

- 就业人数：200 万（直接就业 50 万，间接就业 150 万）

- 收入：210 亿美元

- 出口：41.2 亿美元（2023-24 年）

- 铸件类型：印度生产几乎所有类型的金属铸件，如

69% of total castings produced.

Indian Casting Production (in Million MT):

•Above table shows Indian Casting Production of last 5 years.

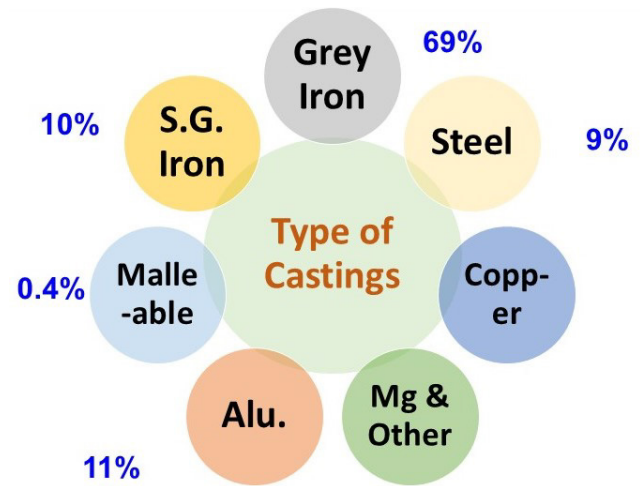
Indian Foundry Industry – Sectors Served

•Indian Foundry Industry serves all major industry sectors. Auto Mobile is the most castings consuming sector with 32% of total production.

	2018-19	2019-20	2020-21	2021-22	2022-23
Grey C.I.	9.41	7.72	7.91	8.62	9.83
SG Iron	1.31	1.22	1.10	1.26	1.46
Malleable	0.05	0.05	0.05	0.05	0.05
Steel	1.21	1.14	0.91	1.05	1.24
Non Ferrous	1.40	1.36	1.34	1.46	1.58
TOTAL	13.38	11.49	11.31	12.44	14.16

Statewise Dispersal of Foundry Units in India (in %):

•Foundries in India is spreaded across the country. Tamil Nadu

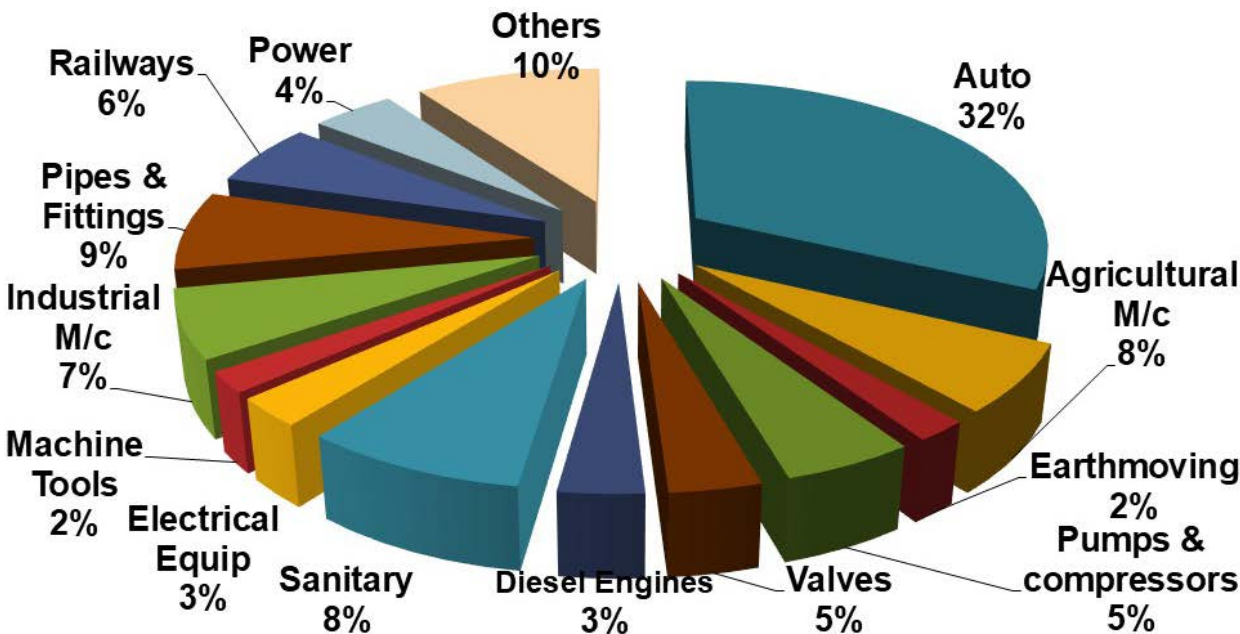


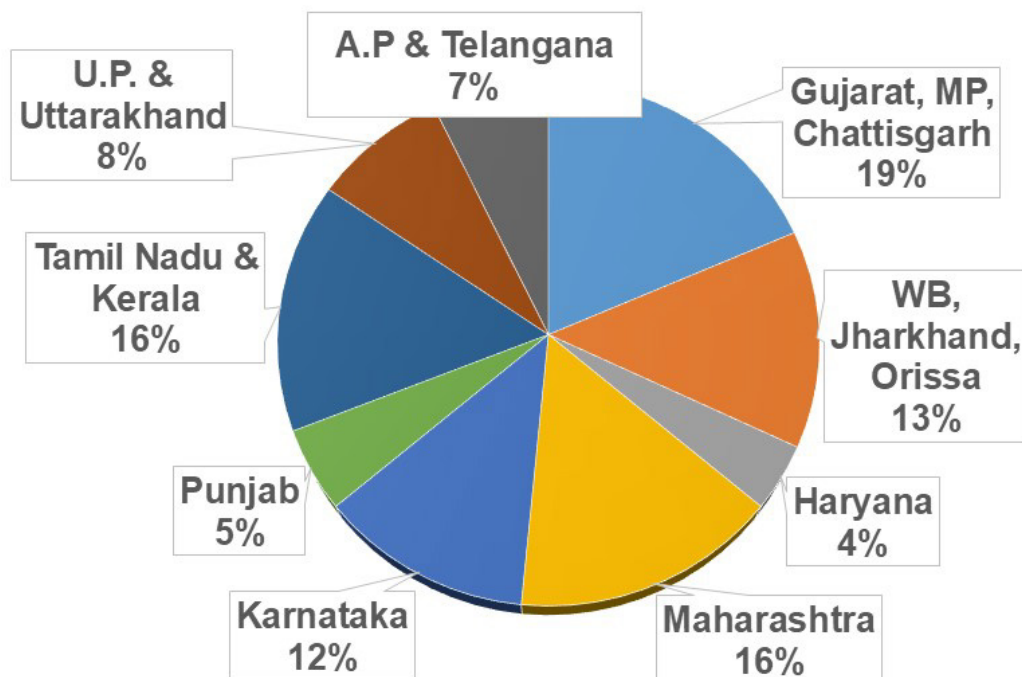
灰铁铸件、球墨铸铁件、铸钢、可锻铸铁，铝、铜、镁和其他有色金属铸件。灰铁件占主要份额，约占铸件总产量的69%。

印度铸件产量（百万吨）：

上表显示了过去 5 年的印度铸件产量。

印度铸造工业 – 服务部门





(Coimbatore, Chennai), Maharashtra (Pune, Kolhapur, Sholapur), Karnataka (Belgaum, Shimoga, Bangalore), Gujarat (Ahmedabad, Rajkot), West Bengal (Howrah, Kolkata) & Punjab (Batala, Jalandhar, Ludhiana) are major states having several foundry clusters. Other major foundries clusters are Agra, Faridabad, Indore.

Factors Driving Growth of Indian Foundry Industry:

- Increasing industrialization and urbanization across India
- Growing demand in the automotive, aerospace, defence and construction ind.
- Adoption of lightweight materials such as Aluminium and Magnesium
- Increasing government investments in infrastructure projects

Indian Foundry Industry – Changing Face:

- Foundries in India are changing rapidly from small and medium to large size units with ultra-modern technologies from all over the world.
- Major focus area of Indian Foundries are:
 - Automation
 - 3D Printing
 - Robotics/ IT Application
 - Foundry Simulation Software
 - Reclamation/ recycling of waste raw material
 - Common Facility Centre
 - Value addition & Up scaling the operations
- Medium size foundries are going from manual pouring to auto pour, conventional sand mixing to intensive mixers and automated sand plant, jolt

印度铸造工业服务于所有主要工业部门。汽车是铸件消费最多的行业，占总产量的 32%。

印度各邦铸造厂分布情况（%）：

印度的铸造厂遍布全国各地。泰米尔纳德邦（哥印拜陀，金奈），马哈拉施特拉邦（浦那，科尔哈布尔，肖拉普尔），卡纳塔克邦（贝尔高姆，希莫加，班加罗尔），古吉拉特邦（艾哈迈达巴德，拉杰科特），西孟加拉邦（豪拉，加尔各答）和旁遮普邦（巴塔拉，贾朗达尔，卢迪亚纳）是拥有铸造集群的主要地区。其他铸造集群是阿格拉、法里达巴德、印多尔等。

推动印度铸造工业增长的因素：

- 印度各地的工业化和城市化程度不断提高
- 汽车、航空航天、国防和建筑行业的需求不断增长
- 采用铝、镁等轻质材料
- 政府增加对基础设施项目的投资

印度铸造工业的变化：

- 印度的铸造厂正迅速从中小型向大型转变，拥有来自世界各地的现代技术。
- 印度铸造厂的主要关注领域是：

squeeze moulding to High pressure and semi High-Pressure lines.

Manpower Skilling:

• Manpower is the biggest challenge for the foundry industry across the world. Indian is no different. With new technologies skill upgradation of existing manpower is also essential.

• IIF has initiated Yogyata Vikas Programme. In-house Training programme by Senior Experts on various topics in 7 languages. It is giving good results.

• Several WhatsApp and LinkedIn discussion groups are generated where foundrymen put their problems and get views and solutions from foundry experts across the country. This has helped small foundries, Which do not have expert technical knowledge to solve their problems, defects and improve their productivity.

Govt. Initiatives Driving Growth:

• The new manufacturing policy envisages the increase in the share of manufacturing in the GDP to 25% from current 15% & to create 100 Million additional jobs in next 10 years.

• Since all engineering & other sectors use metal castings in their manufacturing, the role of foundry industry to support manufacturing is very vital.

• Govt. of India is focusing on 15 manufacturing sectors to drive the growth under Make in India Movement. Out of this fifteen sectors all most 8 sectors are major consumers of castings.

• Govt. of India is focusing on indigenization of defense 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.

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

• India's domestic demand, demographics and government

- 自动化
- 3D 打印技术
- 机器人 / IT 应用
- 铸造仿真软件
- 废旧原料的回收利用
- 公共设施中心
- 增值和扩大运营规模

中等规模的铸造厂正在从手动浇注到自动浇注，传统的混砂到混砂机 and 自动化砂厂，震动挤压成型到高压和半高压生产线。

人力资源：

人力资源是全球铸造行业面临的巨大挑战，印度也不例外。随着新技术的发展，现有人力的技能升级也至关重要。

印度铸造协会发起了 Yogyata Vikas 计划。高级专家以 7 种语言就各种主题开展内部培训，正在取得良好的效果。

在 WhatsApp 和领英 (LinkedIn) 的几个讨论群中，铸造员工提出了他们的问题，并从全国各地的铸造专家那里获得了观点和解决方案。这有助于小型铸造厂，他们往往没有专业的技术知识来解决他们的问题和缺陷以提高他们的生产能力。

政府推动增长的举措：

新的制造业政策将制造业在 GDP 中的份额从目前的



Defence



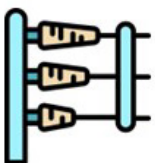
Automobile



Railways



Renewable Energy



Textile



Aerospace



Construction



Petrochemicals

programmes like PLI Schemes encouraging manufacturing, put it in a unique advantageous position.

•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.

Towards Green & Sustainable Castings:

•With increasing awareness about environmental responsibility, Indian Foundry Industry is going for making Green and Sustainable Castings.

- Major Initiatives are:
 - Use of Solar & Wind Energy
 - Reclamation of Sand
 - Use of Sand & Slag in making Paver Blocks, Roads
 - Energy Efficiency Improvement
 - Solar Energy:
 - Roof Top Solar Plants
- Many foundries are putting up roof top solar plants on their shed. 570 KW plant is generating 68,400 units /month.
- Collaborative Model
- 3-4 foundries together are putting common Solar Plant ranging from 1-5 MW.
- Sand Reclamation:
- Many foundries are going for Green Sand Reclamation Plants. Kolhapur, Belgaum have put up a common Sand Reclamation Plant in foundry clusters
- Sand and Slag Disposal:
- Few of the foundries have started converting their used sand into paver blocks and bricks.
 - IIF with efforts has got approval of Indian Govt. to use foundry sand in roads construction in villages and small towns.

Exports of Castings:

•India ranks 2nd No. in exports of castings. With increasing demand from world over foundry industry is targeting to increase their export revenue from USD 4.1 Billion in 2023 by about 15% in coming

15% 增加到 25%，并在未来 10 年内创造 1 亿个额外的就业机会。

由于所有工程和其他部门在制造中都使用金属铸件，因此铸造行业对制造业的支持作用非常重要。

印度政府正专注于 15 个制造业部门，以推动“印度制造”的增长。在这 15 个行业中，有 8 个主要的行业都是铸件的主要消费市场。

印度政府正专注于国防生产的本土化、铁路和公路基础设施的发展。随着这些利基行业的高速发展，未来几年对铸件的需求也将增长数倍，需要精密铸件以满足这些行业的安全关键要求。

政府对上述行业的推动为铸造行业带来了发展机会。

印度的国内需求、人口结构和政府政策，如鼓励制造业的 PLI 计划，使其处于独特的优势地位。

铸造行业的技术和能力提升变得尤为突出，因为铸造行业可以在引导印度达到 5.0 万亿美元的经济中发挥不可或缺的作用。

走向绿色和可持续铸造：

随着对环境责任意识的提高，印度铸造行业正在努力向绿色和可持续铸造转变。

主要举措有：

- 利用太阳能和风能
- 砂子的回收
- 用砂和矿渣制造铺路机砌块、道路
- 提高能源效率

太阳能：

屋顶太阳能电站

许多铸造厂正在他们的铸造厂安装屋顶太阳能发电厂。570 千瓦的工厂每月供 68400 台发电。

协作模型

3-4 家铸造厂正在共同建设 1-5 兆瓦的太阳能发电厂。

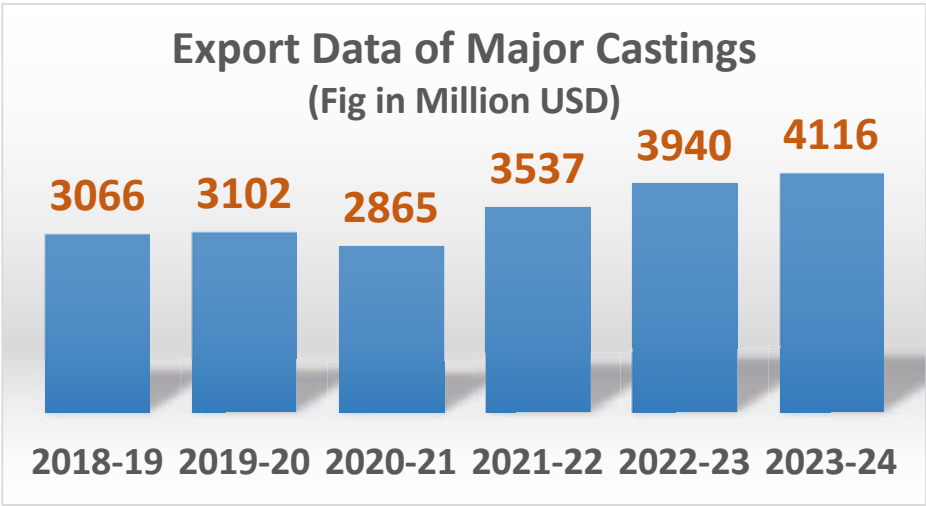
砂处理：

许多铸造厂正在寻找绿色砂处理工厂。

科尔哈布尔和贝尔高姆建立了一个共同的砂处理和回收使用项目。

铸造集群中的工厂。

废砂处理：



Import Data of Major Castings (Fig in Million USD)



铸造厂开始将用过的砂子用作铺路砖和砖块。

经过努力，印度铸造协会获得了印度政府的批准，可以在村庄和小城镇的道路建设中使用铸造用废砂。

铸件出口：

印度在铸件出口方面位居第二；随着世界各地铸造行业需求的增加，未来 5 年的目标是将其出口收入从 2023 年的 41 亿美元提高约 15%。

印度正着眼于用国产化取代进口铸件。来自韩国、日本、德国的汽车制造商是汽车铸件的主要进口商。

印度铸造厂现在有能力生产任何类型的铸件。

目前，印度出口的前 10 大产品中并没有铸件。印度铸造协会和印度铸造业正致力于将铸件纳入这一名单。

为了增加出口，确定的主要领域是

- 目标特定出口市场
- 针对出口市场开发定制产品
- 加强市场推广工作
- 与外国公司建立合作关系
- 遵守国际标准和法规

包括铸造业在内的所有行业都持有乐观精神和增长趋势。随着经济的稳定增长和基础设施的发展，广泛的潜在铸造消费行业正在将他们的生产厂放在印度。铸造厂有很大的机会，必须以有针对性的方式满足当地和全球不断增长的市场需求。总体而言，印度铸造业在未来十年前景光明。

致谢：

印度铸造协会铸造信息中心

图片提供：AKP Ferrocast Pvt. Ltd., Govind Steel Pvt. Ltd., Ammarun Foundries Pvt. Ltd., Verstaile Industries, Zanvar Group, Masta Group, Aqua Flow Group, Belgaum Foundry Cluster

世界铸造组织 2023 年全球铸造报告

世界铸造组织 2024 年全球铸造报告

https://www.gifa.com/en/Media_News/News/Reports。■

5 years.

•India is eyeing to replace imported castings with indigenisation. Auto Mobile manufacturers from South Korea, Japan, Germany are the major importers of Auto castings.

•Indian foundries are now having capability to produce any type of these castings.

•At present list of top 10 products exported from India does not have castings in it. IIF and Indian Foundry Industry is focusing to bring castings in this lists.

•To increase the exports major area identified are

•Target Specific Export Markets

•Develop Customized Products for Export Markets

•Strengthen Marketing and Promotional Efforts

•Establish Partnerships with Foreign Companies

•Comply with International Standards and Regulations

There is spirit optimism and growth of the economy is there in all the sectors including Foundry Industries. With stable economic growth and infrastructure development wide range of potential casting consumer industries are putting their manufacturing facilities in India. Foundries have big opportunity and have to meet increasing demand locally and globally in a targeted manner. In general, Indian Foundry Industry is having a bright future in coming decade.

IIF promotes United India, United Foundryman with Vision,

Acknowledgement:

•Foundry Informatic Centre, IIF

•Photo Courtesy: AKP Ferrocast Pvt. Ltd., Govind Steel Pvt. Ltd., Ammarun Foundries Pvt. Ltd., Verstaile Industries, Zanvar Group, Masta Group, Aqua Flow Group, Belgaum Foundry Cluster

•WFO Global Foundry Report – 2023

•WFO Report – 2024

•https://www.gifa.com/en/Media_News/News/Reports ■



New Platform, New Achievements: Metal China & Diecasting & Nonferrous China 2025

2025 “铸博会” “压铸展” 津门起航 再创辉煌

An Industry Leading and Professional Event

Initiated in 1987, China International Foundry Expo (METAL CHINA) is the only foundry exhibition sponsored by a national industry association. Known as the vane of China's foundry industry, it has attracted the attention of the world foundrymen every year and it has witnessed the significant growing of participants in respects of both international exhibitors and visitors year by year.

Aiming at keeping as the industry leader, full of innovation, development and service, the 23rd China International Foundry Expo (METAL CHINA 2025) together with the 18th China International Diecasting Industry Exhibition and Nonferrous China, will be held from May 20-23, 2025 in the National Convention and Exhibition Center (Tianjin), a super large national exhibition hall located in Northern China.

Characterized by Innovative products, high-end equipment, innovative solutions and cutting-edge technologies

The bright future of metalcasting is yours to explore at Metal China and Diecasting China 2025, from the newest manufacturing tech to the latest breakthroughs, from advanced materials to one-stop intelligent solutions of metalcasting, Metal China and Diecasting China

行业引领 专业平台 展示盛会

秉承行业引领、创新发展、服务行业的宗旨，第二十三届中国国际铸造博览会 (METAL CHINA)、第十八届中国国际压铸工业展览会 (DIECASTING CHINA)、第十八届国际有色及特种铸造展览会 (NONFERROUS CHINA) 将于 2025 年 5 月 20-23 日在超大型国家级展馆——国家会展中心（天津）盛大举办。

因应产业需求、促进产业发展，2025 年，“铸博会”“压铸展”“有色展”再次回归天津，乘“打造北方高端装备产业高地和京津冀智能制造强区、强化产业集群构建、强化产业链壮大延伸”的东风，通过展会的带动效应，强链、补链、延链，夯实高端装备制造业、加速产业转型升级，为加快培育新质生产力、构建铸造产业链高质量发展新格局再立新功。

创新产品高端装备备受瞩目、创新方案前沿技术点亮盛会

展品范围全覆盖、聚焦先进制造产业链：全面展示铸

will give you the first look at the trends and innovations that will shape the industry.

With an exhibition area of nearly 80,000 square meters and more than 100 wonderful industry activities, the exhibition will attract more than 1,000 well-known exhibitors and hundreds of thousands of professional visitors from more than 50 countries and regions to participate online and offline. It will once again become an important platform to promote the transformation and upgrading of the foundry industry and take the high-quality development road.

A medium and platform to promote communication and discussion

A brand new Metal China & Diecasting China will be staged in Tianjin in 2025, with a larger scale of more than 80,000 square meters, covering the whole industrial chain of metalcasting including foundry equipment, materials, castings, and advanced foundry technologies and intelligent solutions, linking the upstream and downstream industries. Nearly 1000 exhibitors will attend the exhibition and 100 supporting programs will be held concurrently, aiming to promote the sustainable development and offer exhibitors and visitors insights into the future of the metalcasting industry.

Linkage of Diecasting brand exhibition and forum, High-quality cast the future

In recent years, with the global consensus on low-carbon and environmental protection, the new energy industry has ushered in significant development. Represented by Magnesium, Aluminum, Titanium, the light metal alloys industry has made breakthroughs in the lightweight technology, and also brings capacious space and numerous opportunities for the future development of the industry. In

造行业的高端、智能、绿色和安全方面的新技术、新装备，为智能制造等领域和实体经济创造新的增长空间和发展机遇；

新质赋能、推动绿色可持续发展：全面展示绿色铸造原辅材料及先进环保生产技术，提高铸造行业绿色环保水平、助力“双碳”目标实现；

高端装备制造产业“明星”产品集中亮相，创新不止，更有多系列产品首秀；

展示压铸有色铸造全材质、全工艺和全产业链，聚焦降本增效、为行业高质量发展赋能。

以展为媒促交流、共话行业大发展

上届展会期间共举办了 100 余项同期活动，其中，由展商自主组织的活动占比 75%，真正实现了“主办搭台、企业唱戏”，以展商需求为导向，以展为媒促交流、促合作、促发展的目的，不仅得到广大参展商的积极支持、大力参与，还取得了会展联动、供需两旺的实际效果。

2025 年，展会同期还将继续举办包括中国铸造协会年会、第五届压铸 CEO 峰会暨有色铸造轻量化高层论坛、行业形势报告、多场新产品发布会、系列高端铸造装备技术论坛、先进铸造技术专题讲座、多场企业战略合作签约仪式、铸件采购供应洽谈会，以及全展期铸造专家答疑、铸造企业家对话、国际贸易供需对接、展商展品推介等在





this regard, CFA will jointly hold the "5th China Foundry Association Die Casting CEO Congress & Forum on Lightweight and Nonferrous Casting" (DCC) with 15 provincial and municipal foundry associations and industry media, as well as international organizations and medias, including the United States, Germany, Mexico, Japan and South Korea, from May 20 to 23, 2025 in Tianjin, China. The annual foundry event and one of the most important industry platforms, the 23rd China International Foundry Expo (Metal China), the 18th China International Die Casting Industry Exhibition (Diecasting China), and the 18th International Nonferrous and Special Casting Exhibition (Nonferrous China) will be held concurrently.



内的形式多样的配套活动。

压铸经典品牌会展联动，高质量铸就未来

压铸展以中国铸造协会经典品牌展“国际有色及特种铸造展览会”为基础，汇聚海内外压铸及上下游杰出企业而成，将全面展示压铸工艺、有色铸造及轻量化发展的新产品、新技术、新装备。

在 2025 年“第十八届中国国际压铸工业展览会”“第十八届国际有色及特种铸造展览会”期间，还将隆重举办“第五届压铸 CEO 峰会暨有色铸造轻量化高层论坛”。

压铸 CEO 峰会暨有色铸造轻量化论坛在业内极具影响力和关注度，每两年举办一届，已成功举办四届。论坛聚焦前沿，关注热点，每届都吸引国内外近千名专家、学者及企业家到场交流。国际压铸展 & 国际有色展更是覆盖压铸、有色铸造全产业链、国际化的品牌展会，每年吸引来自 20 多个国家地区的千余家展商和 2 万多名观众参与。2025 年这两个业内知名品牌活动同期举办，必将为所有参与者提供一个更加全面、深入的交流平台。这不仅是规模的跨越，更实现了专业深度与广度的双重提升。

本届会展活动，将以开放的心态和创新的精神，聚焦压铸有色铸造全材质、全工艺和全产业链，将迎接来自中国、德国、意大利、美国、法国、墨西哥、土耳其、日本、韩国、印度等 20 多个国家和地区的精英们前来共同探讨，分析行业发展趋势与前景，分享前沿技术与理念，为行业高质量发展赋能。

Linking global foundry industry for global industry chain and supply chain

As a leading global event in the foundry industry, more and more foundry companies are using METAL CHINA/DIECASTING CHINA as the best platform for showcasing their brand, the perfect channel to launch new products, and the best way to expand their international market. The exhibition highlights internationalization, and more and more international foundry companies and buyers are paying more attention to cooperation with Chinese enterprises.

With the rapid improvement of technology in the domestic casting industry, the demand for domestic and international markets continues to rise, and the convenience of international personnel exchanges continues to improve. At the same time, based on the strong attractiveness of China's casting industry, the events will provide a face-to-face communication and trade platform for domestic and foreign industries in a more open economic and trade environment, to realize win-win cooperation and development.

Join us in the industry grand event and together for a better future!

For more information, please visit us at: www.expochina.cn ■

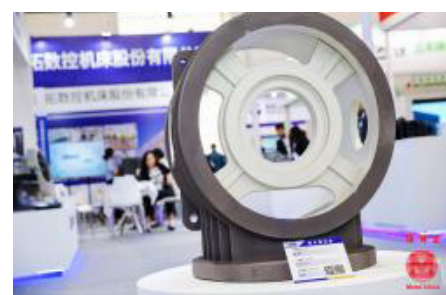
链接全球铸造、拓展国际市场

作为全球领先的铸造行业盛会，越来越多的铸造企业把铸博会作为企业品牌展示的最佳平台、新品发布的首秀舞台，以及拓展国际市场的最优途径，同时，作为中国铸造行业发展的“风向标、晴雨表”，中国铸造依托强大的产业链供应链，能够提供满足各类需求且有竞争力的产品和服务，展会凸显国际化，越来越多的国际铸造企业以及采购商也更加重视与中国企业的合作。

随着国内铸造行业技术水平的快速提升，国内国际的市场需求不断攀升，以及国际人员往来便利性水平不断提高，同时基于中国铸造业强大的吸引力、中国铸造协会庞大的国际朋友圈的加持，铸博会将在更为开放的经贸环境下，为国内外行业提供面对面交流的商贸平台。

锁定行业盛会、共赴美好未来！

更多展会信息，请访问网站：www.expochina.cn ■





Technologies
Processes
Applications
Products



21-25 June
Düsseldorf
Germany

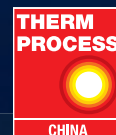
2027

The Bright World of Metals

30 Nov-02 Dec 2026
METEC India
Mumbai, India



21-24 Sep 2026
THERMPROCESS China
Shanghai, China



17-19 Sep 2026
ANKIROS
Istanbul, Türkiye



18-20 Sep 2025
ALUEXPO
Istanbul, Türkiye

ALUEXPO

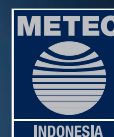
28-30 Oct 2026
GIFA Mexico
Monterrey, Mexico



06-08 Sep 2025
GIFA/METEC
Middle East Africa
Cairo, Egypt



09-12 Sep 2026
GIFA/METEC
Indonesia
Jakarta, Indonesia



See you in **Bangkok** and **Jakarta**

17-19 Sep 2025
GIFA/METEC Southeast Asia
Bangkok, Thailand



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New And Intelligent Brake Disc Grinding Equipment

新型、智能刹车盘研磨设备

Xiamen Dakota Machinery Co., Ltd. , established in 2014, is a high-tech enterprise specializing in research, development, production and sales of automotive brake disc grinding equipment. And we have introduced intelligent brake disc grinding equipment to the global foundry industry.

Equipment profile:

1. Automatically and intelligently recognizes $\phi 200\text{mm}$ - $\phi 420\text{mm}$ products of various specifications, and can be mixed in production.

2. Adopting advanced force control system and automatic compensation function for grinding wheel wear to ensure precise control and stability of grinding.

3. Innovative upper and lower equalized grinding method, reducing 60% grinding wheel wear cost.

4. Adopting new technology, the stacked grinding wheel effectively improves the service life of the grinding wheel by 200% and reduces the production cost by 10%.

5. Single cycle time: 80s / piece

6. Equipment size: 4642x1978x2304mm

7. Equipment weight: 3600 KG

E-mail: service@xm-dakota.com

Web: www.xm-dakota.com

厦门达科塔机械有限公司成立于 2014 年，专业从事汽车刹车盘打磨设备研发、生产、销售一体的高新技术企业。并向全球铸造行业推出智能刹车盘研磨设备。

设备简介：

1. 自动智能识别 $\phi 200\text{mm}$ - $\phi 420\text{mm}$ 各种规格产品，并可混合在线生产。

2. 采用先进的力控系统以及砂轮磨损自动补偿功能，保证了接触力的精确控制与稳定性。

3. 创新上下均衡打磨方式，降低 60% 砂轮耗损成本。

4. 采用新工艺，堆积砂轮有效提高砂轮 200% 使用寿命，降低 10% 生产成本。

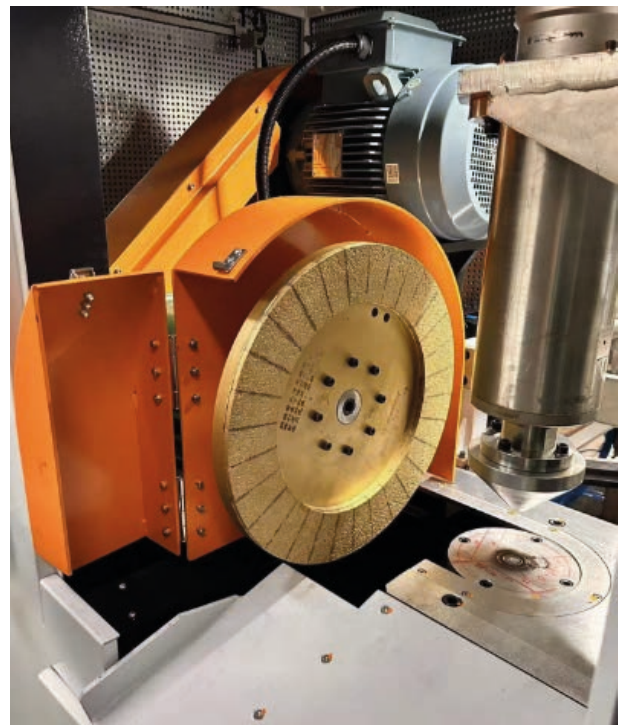
5. 单循环时间；8-10s/ 个。

6. 设备尺寸：4642x1978x2304mm

7. 设备重量：3600 KG

E-mail: service@xm-dakota.com

Web: www.xm-dakota.com



An Introduction to Nitrogen in Cast Iron

浅谈铸铁中的氮

As everyone knows, when the “nitrogen” density in molten iron is over a certain value, it is easy for the poured castings to have cracking-gap nitrogen porosity defect, which is commonly seen in gray cast iron, with complex forming theory and easily misunderstood as shrinkage defect, so that nitrogen porosity defects have become a doubtful and difficult issue for casting factories, and people even turn pale on the mention of “nitrogen”.

The relevant material introduced the morphology of nitrogen porosity under electron microscope has three typical characteristics including milky dendrite head, turtle back pattern and carbon film. It is also pointed out nitrogen content in molten iron is directly related to such casting raw materials as steel scrap, recarburizer, resin. It is proposed that nitrogen content in molten iron must be strictly controlled within 120ppm.

The common process measures to prevent nitrogen porosity defects in castings include: strictly controlling raw materials quality, using low nitrogen content steel scrap, recarburizer and resin; reducing gas evolution of sand core, improving gas exhaust of sand core to ensure smooth gas exhaust; adding overflow riser at the position of defect. The above measures are usually referred to “reduction, exhausting, overflowing”, which has achieved excellent results during improvement process.

So, is it better to have a lower nitrogen content in molten iron? According to the latest research, during the production of gray cast iron, nitrogen in molten iron has the effect of solid solution strengthening and passivation of graphite, which significantly influences the matrix structure, graphite morphology and mechanical properties of gray cast iron. With the increase of nitrogen content in molten iron, the graphite morphology, matrix structure and mechanical properties will undergo the following

众所周知，当铁液中的“氮”超过一定的浓度时，浇注后的铸件容易产生裂隙状的氮气孔缺陷，氮气孔缺陷在灰铁铸件中较为常见，其形成机理较复杂，且容易和缩松缺陷相混淆，导致氮气孔缺陷一度成为铸造工厂的疑点和难点问题，甚至谈“氮”色变。

相关的资料介绍：电镜下观察氮气孔表面形貌，具有乳状枝晶头、龟背纹和碳膜三大典型的特征，指出铁液中的氮含量和废钢、增碳剂、树脂等铸造原材料直接相关，提出铁液中氮含量必须严格控制在 120ppm 以内。

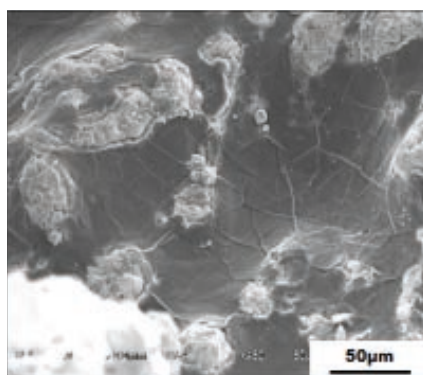
为防止铸件产生氮气孔缺陷，常见的工艺措施有：严格控制原材料品质，采用氮含量低的废钢、石墨化增碳剂和低氮树脂；减少砂芯发气量，加强砂芯排气，确保砂芯排气通畅；在氮气孔缺陷部位增加溢流冒口等，通常将以上措施简称为“减、排、溢”，并在改善过程中取得了良好的效果。

那么，铁液中的氮含量是不是越低越好呢？根据最新的研究表明：生产灰铸铁时，铁液中的氮具有固溶强化和钝化石墨的作用，显著影响灰铸铁的基体组织、石墨形态及力学性能，随着铁液中氮含量的增加，石墨形态、基体组织和力学性能将发生如下改变：

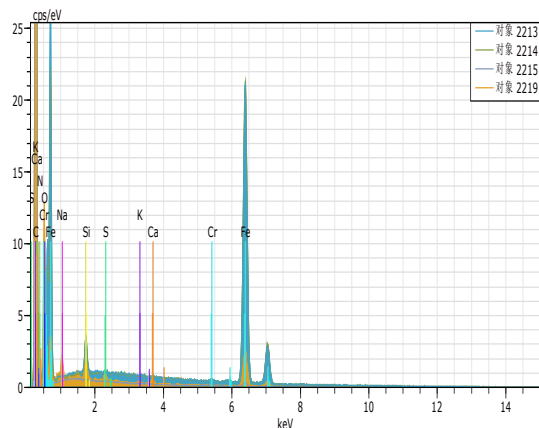
1. 片状石墨长度变短，宽度稍有增加，弯曲长度增加，石墨端部钝化；
2. 基体组织中珠光体数量增多，粗片状珠光体比例减



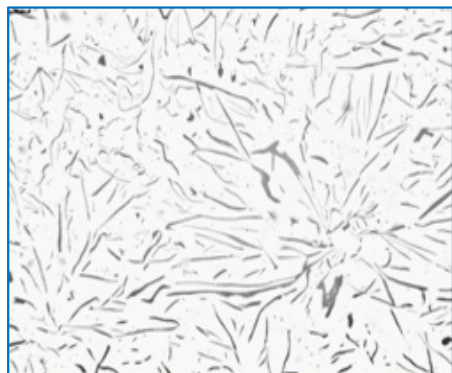
Nitrogen Porosity Morphology
氮气孔形态



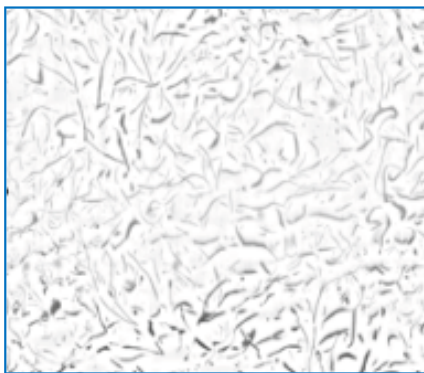
Nitrogen Porosity by SEM
氮气孔电镜图



Atlases of Energy Distribution
氮气孔能谱图



Iron With Nitrogen 54ppm
含氮 54ppm



Iron with Nitrogen 110PPM
含氮 110ppm



NO Analyzer
氮氧分析仪

changes:

1. The length of flake graphite becomes shorter, the width slightly increases, the bending length increases and the graphite end is passivated.

2. The number of pearlite in matrix structure increases, the proportion of coarse flake pearlite decreases, and the lamellar spacing of pearlite decreases. It can be seen that nitrogen is an element that stabilizes and refines pearlite and inhibits the ferrite formation.

3. With the continuous increase of nitrogen content, the tensile strength of casting also increases. When the nitrogen content is up to 126ppm, the tensile strength reaches 395 Mpa. When the nitrogen content exceeds 126 ppm, the tensile strength of casting begins to decline, the nitrogen porosity in the casting occurs.

Usually, when producing high-grade gray cast iron, precious metals such as copper, tin, nickel, and molybdenum need to be added. The more alloys addition not only increases production cost, but also seriously deteriorates the processing performance of castings. In recent years, foreign advanced foundries have controlled the nitrogen content in the original liquid iron within 90ppm ~ 120ppm by adding nitrided manganese, which can reduce the content of alloying elements in cast iron, reduce the cost of production at the same time, but also obtain good matrix structure and mechanical properties, especially the processing properties of castings have been significantly improved.

Our ferromanganese nitride is a mature and stable nitrogen increasing material with high nitrogen content, fast absorption, high absorption rate and good stability. Ferromanganese nitride can be added in the furnace when batching, and can also be added to the pouring ladle with stream before tapping. Production practice has proved that addition of 0.1% ferromanganese nitride in molten iron can improve nitrogen content of 15ppm ~ 20PPm. The addition amount is usually 0.1%~0.3%. When the nitrogen content is adjusted to 90ppm ~ 120ppm, the tensile strength of casting can be improved 30Mpa ~ 60Mpa, the addition amount of such alloys as copper, tin, nickel, molybdenum can be reduced by 25% ~ 65%,

少, 珠光体层片状间距减小。由此可见, 氮是稳定并能细化珠光体, 抑制铁素体形成的元素。

3. 随着氮含量的不断增加, 铸件的抗拉强度也随之提高, 当含氮量达到 126 ppm 时, 试样的抗拉强度达到 395Mpa, 当氮含量超过 126 ppm 时, 抗拉强度开始下降, 铸件出现氮气孔缺陷。

通常情况下, 生产高牌号灰铸铁时, 需要加入铜、锡、镍、钼等贵金属, 合金加入量越多, 不但增加了生产成本, 也严重恶化了铸件的加工性能。近年来, 国外先进铸造工厂通过在原铁液中添加氮化锰铁, 将原铁液中氮含量控制在 90ppm ~ 120ppm 范围内, 可降低铸铁中合金元素的含量, 在降低生产成本的同时, 还能获得良好的基体组织和力学性能, 尤其是铸件的加工性能得到了明显的改善。

河南伟业公司的氮化锰是一种成熟、稳定的增氮材料, 具有氮含量高、吸收快、吸收率高、稳定性好等特点。氮化锰可在配料时炉内加入, 也可在出铁水时随流加入浇注包内。生产实践表明, 铁液中加入 0.1% 的氮化锰铁可提升 15ppm ~ 20PPm 的氮含量。氮化锰铁加入量一般为 0.1% ~ 0.3%, 当铁液中氮含量调整到 90ppm ~ 120ppm 时, 铸件抗拉强度可提高 30Mpa ~ 60Mpa, 铜、锡、镍、钼等合金的加入量可降低 25% ~ 65% 不等, 每吨铸件可降低材料成本 150 元 ~ 300 元, 具有显著的成本优势。

需要说明的是: 合理使用氮化锰, 需要满足三个条件:

1. 熔化配料所使用的原材料品质需稳定;

2. 选用高品质的氮化锰铁, 氮化锰铁应具备以下特点: 氮含量高; 吸收快; 吸收率高; 稳定性好;

and the cost of each ton of casting can be reduced by 150~300 yuan, which has a significant cost advantage.

It should be noted that three conditions should be satisfied to use ferromanganese nitride properly.

1.The quality of raw materials used for melting ingredients should be stable;

2.The quality of ferromanganese nitride selected should be high with following characteristics:high nitrogen content, fast absorption, high absorption rate and good stability;

3. The foundry should have a nitrogen and oxygen analyzer that can accurately detect and control the nitrogen content in the molten iron.

Our ferromanganese nitride has been successfully applied in a number of Chinese foundries, achieving excellent casting quality and economic benefits. Henan Weiye Company is looking forward to further exchanges and cooperation with you to jointly promote the innovation and development of new processes and new materials in China's foundry industry. Welcome to contact us via E-mail chinaweiyee@pdswy.cn or visit website www.shengshiweiye.cn to know more about us. ■

3. 铸造工厂应具备氮氧分析仪，能精准检测和控制铁液中的氮含量。

河南伟业公司的氮化锰已在国内多家铸造工厂取得了成功的应用，实现了良好的铸件品质和经济效益，河南伟业公司期待与您做进一步的交流与合作，共同推动中国铸造行业新工艺、新材料的创新和发展。欢迎通过 E-mail: chinaweiyee@pdswy.cn 联系我们或登录网站 www.shengshiweiye.cn 了解更多详情。■

SPECTRO Introduces The All-New Spectro Xsort Handheld Ed-Xrf Spectrometers

SPECTRO 推出全新的 SPECTRO xSORT 手持式 ED-XRF 光谱仪

SPECTRO Analytical Instruments introduced its newest generation of SPECTRO xSORT handheld ED-XRF spectrometers with improved features that maximize speed, ease, cost efficiency, and advanced performance in the analysis of 6 metals and alloys.

The newest SPECTRO xSORT handheld spectrometers enable high-throughput, highly reliable elemental testing and spectrochemical analysis of common metals and alloys, including 46 elements in 16 metal matrices, from the scrapyard to the factory to the foundry floor.

Features and benefits of the new advanced SPECTRO xSORT analyzers include:

Faster Analysis: The entry-level SPECTRO xSORT Alloy model, featuring a Silicon PIN (Si-PIN) detector, delivers metal-grade identification in seconds. The more powerful standard SPECTRO xSORT, with its high-resolution, high-sensitivity silicon drift detector (SDD), analyzes most alloys

斯派克分析仪器公司推出了其全新一代 SPECTRO xSORT 手持式 ED-XRF 光谱仪，该光谱仪进行了功能升级，可最大限度地提高金属和合金分析的速度、易用性、便利性和先进性能。

最新的 SPECTRO xSORT 手持式光谱仪能够对常见金属和合金进行高通量、高度可靠的元素测试和光谱化学分析，包括从废料场到工厂再到铸造车间的 16 种金属基质中的 46 种元素。

新型先进 SPECTRO xSORT 分析仪的特点和优势包括：

更快的分析：入门级 SPECTRO xSORT 合金型号具有硅 PIN (Si-PIN) 探测器，可在几秒钟内进行金属等级识别。更强大的标准 SPECTRO xSORT 具有高分



in only 2 seconds and identifies light element alloys in 7 seconds. The result is hundreds of inspections per shift for improved productivity.

Easier to Use: Reduced in size and well balanced, SPECTRO xSORT is optimized for day-long, fatigueless, one-handed operation. The ergonomic, field-proven design includes a light-squeeze trigger; an easy-reading, 5-inch wide-angle, high-definition touch display; physical buttons for gloved hands; and a smaller head for use in tight spots.

More Flexibility: Analytical flexibility is maximized, and SPECTRO xSORT offers 2 standard spot sizes. Users benefit from ultra-wide coverage of elements and alloys without switching between samples.

Superior Software: Its powerful XRF Analyzer Mobile operating software and fast-reaction Industrial Android modules deliver touch operation, hardened security, quick access, and Windows PC compatibility. Standard features include a spectra viewer and a customizable metal-grade library.

Built-In Protection and Standardization: The analyzer's automatic shatter protects internal components as the sample material for SPECTRO's unique iCAL (Intelligent Calibration Logic) standardization — for continuous system monitoring and correction so that all installed methods are always ready to use.

Additional features and options include a long-lasting quick-change battery, an onboard GPS, two cameras, Wi-Fi, and Bluetooth connectivity, microSD storage, a docking station, and a smaller attachment sample chamber.

The advancements of the newest SPECTRO xSORT handheld metal analyzers draw from SPECTRO's renowned

分辨率、高灵敏度的硅漂移探测器（SDD），可以在 2 秒内分析大多数合金，并在 7 秒内识别轻合金元素。每班可进行数百次检查，以提高生产率。

更易于使用：SPECTRO xSORT 尺寸更小、平衡良好，适合全天、无疲劳、单手操作。符合人体工程学、经过现场验证的设计包括一个轻扣扳机；易于阅读的 5 英寸广角高清触摸屏；可识别手套物理按钮；以及一个较小的头，适用于狭窄的地方。

更灵活：分析灵活性最大化，SPECTRO xSORT 提供 2 种标准光点尺寸。用户受益于元素和合金的超宽覆盖范围，而无需在样品之间切换工艺。

卓越的软件：其强大的 XRF 分析仪移动操作软件和快速反应的工业 Android 模块提供触摸操作、强化安全性、快速访问和 Windows PC 兼容性。标准功能包括光谱查看器和可定制的金属级库。

内置保护和标准化：分析仪自动快门保护内部组件，并作为 SPECTROs 独特的 iCAL（智能校准逻辑）标准化的样品材料，用于连续的系统监测和校正，以便所有安装的方法始终可供使用。

其他功能和选项包括长效快换电池、车载 GPS、两个摄像头、Wi-Fi 和蓝牙连接、microSD 存储、扩展坞和较小的可连接样品室。

最新 SPECTRO xSORT 手持式金属分析仪的进步得益于 SPECTRO 在全球实验室光谱分析领域的领先地位。

leadership in spectrographic analysis for global laboratories. This lineage includes the benchtop flagship SPECTROLAB S, a market leader for ultra-precise analysis; SPECTRO's best-selling SPECTROMAXx stationary metal analyzer; and the powerful, portable SPECTROPORT and mobile SPECTROTEST metal analyzers.

AMECARE Performance Services ensure maximum uptime, optimum performance, and the longest possible equipment life for all SPECTRO elemental analyzers with high-value, customized support delivered by hundreds of experienced service engineers in 50 countries. ■

该系列包括台式旗舰 SPECTROLAB S，它是超精确分析的市场领导者；SPECTRO 最畅销的 SPECTROMAXx 固定式金属分析仪；以及功能强大的便携式 SPECTROPORT 和移动 SPECTROTEST 金属分析仪。

AMECARE 性能服务确保所有 SPECTRO 元素分析仪的最大正常运行时间、最佳性能和最长的设备寿命，并由 50 个国家的数百名经验丰富的服务工程师提供高价值的定制支持。■

Integrated Gas Heater For Enhanced Core Production

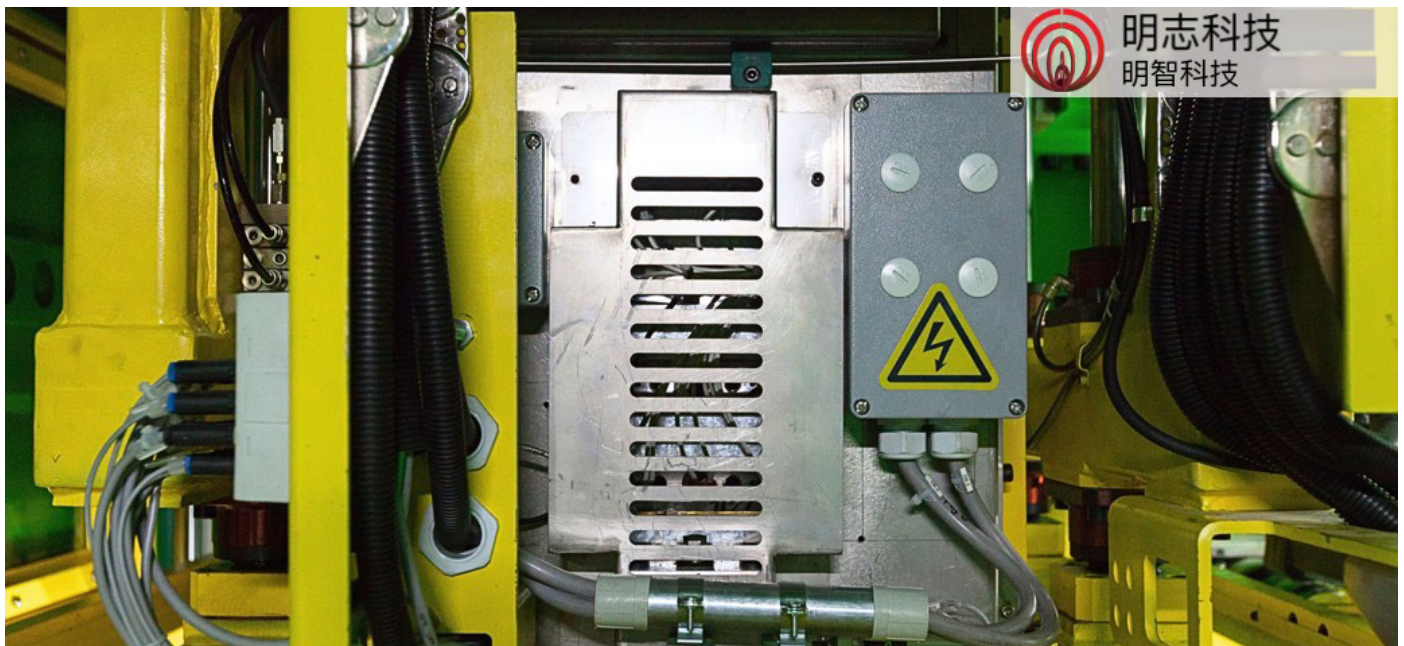
用于增强型砂芯生产的集成式气体加热器

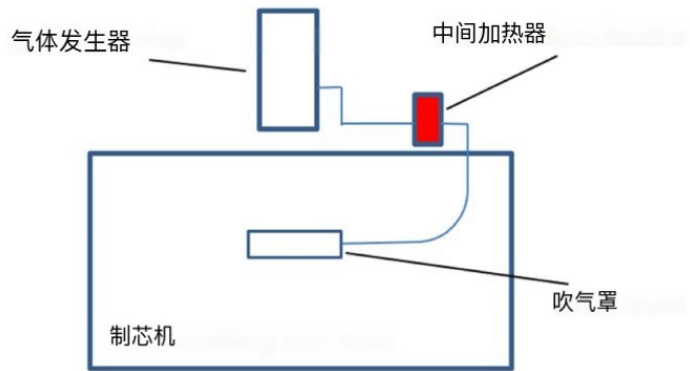
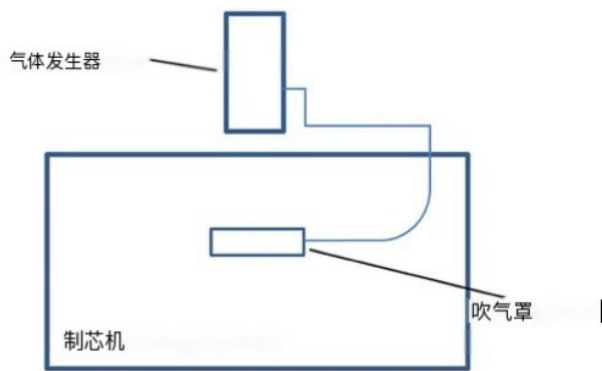
Mingzhi Technology Explores an Innovative Approach to Heating in Core Making for Improved Efficiency and Environmental Impact.

In core making production, efficient gas heating is crucial for optimizing the core production outcomes across various processes, especially traditional cold box and inorganic methods. This often involves a connected series of independent gas heating units, which result in energy inefficiency and environmental concerns. Mingzhi Technology seeks to address these challenges through innovative gas heating solutions, aiming to enhance operational efficiency, environmental

减少环境影响。

在制芯生产中，高效的气体加热对于优化各种工艺的制芯结果至关重要，特别是传统的冷箱和无机方法。这通常涉及一系列相互连接的独立气体加热装置，导致能源效率低下和环境问题。明志科技致力于通过创新的燃气供暖解决方案来应对这些挑战，旨在提高运营效率、环境可持续性和安全性。





sustainability, and safety.

Focusing on the conventional cold box method, core making machine relies on two separate and connected gas heating units, including air and amine-based product gas heaters, connected by pipelines to form a gas generator which emits high temperature gas. This is conducted through a lengthy series of pipelines into the blow hood (blow plate), before finally reaching the core box to complete core curing. However, this setup leads to significant heat loss due to the lengthy transmission distance, resulting in suboptimal production conditions with respect to the catalyst consumed. Test data shows that when the set temperature of the air heater is 150°C and that of the amine-based product gas heater is 120°C, the inlet temperature of the blow hood (blow plate) can only reach 70°C (heat energy loss around 50%), leading to a series of suboptimal conditions in core production. The low temperature at the inlet of the blow hood (blow plate) creates a poor amine-based product gasification effect, therefore extended blowing time is required for core curing, resulting in low core production efficiency. Countering this, requires increasing the amount of amine-based product, which leads to significant material waste. Furthermore, to achieve a constant high gas temperature, the heater requires greater energy consumption, which is in opposition to energy conservation and environmental protection targets. Additionally, this consequent consumption of amine-based product generates a high concentration of gas emission output creating unhealthy operating conditions.

To address these apparent issues, Mingzhi Technology has explored various solutions. Here we compare their benefits and effects in practical application:

Proposed Solutions:

Add an intermediate Heater:

Adding an intermediate heater along the pipeline between the gas generator and blow hood enables additional heating of the amine-based product gas prior to entering the blow hood. While this improves the gas temperature stability, the

以传统的冷箱法为重点，制芯机依靠两个独立且连接的气体加热单元，包括空气和胺基产品气体加热器，通过管道连接形成一个排放高温气体的气体发生器。这是通过一系列漫长的管道进入吹气罩（吹气板），然后最终到达芯盒完成芯固化。然而，由于传输距离长，这种设置会导致大量热量损失，从而导致催化剂消耗的生产条件不理想。测试数据显示，当空气加热器的设定温度为 150°C，胺基产品气加热器的设定温度为 120°C 时，吹罩（吹板）的入口温度只能达到 70°C（热能损失约 50%），导致堆芯生产出现一系列次优条件。吹气罩（吹气板）入口处的低温会产生较差的胺基产品气化效果，因此需要延长吹气时间来固化砂芯，导致砂芯生产效率低。为了解决这个问题，需要增加胺基产品的量，这会导致大量的材料浪费。此外，为了实现恒定的高气体温度，加热器需要更大的能耗，这与节能和环保目标背道而驰。此外，由此产生的胺基产品的消耗会产生高浓度的气体排放，造成不健康的操作条件。

为了解决这些明显的问题，明志科技探索了各种解决方案。在这里，我们比较了它们在实际应用中的好处和效果：

建议解决方案：

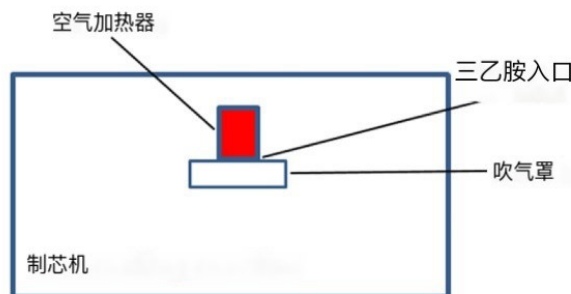
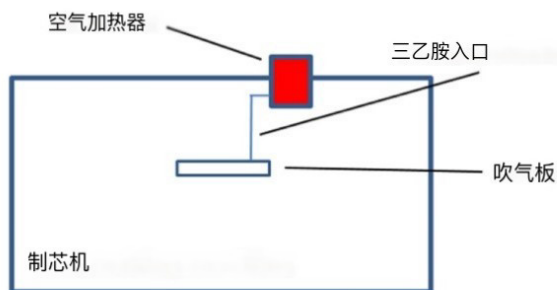
1. 添加中间加热器：

在气体发生器和吹罩之间的管道上增加一个中间加热器，可以在胺基产品气进入吹罩之前对其进行额外加热。虽然这提高了气体温度稳定性，但延长的管道继续限制了砂芯制造的效率。

2. 使用单个紧凑型加热器：

通过将加热功能整合到一个紧凑的单元中，并将其战略性地放置在吹罩入口附近，可以最大限度地减少热量损失和空间要求。这种方法显著提高了入口处的胺基产品气体温度，提高了砂芯生产效率，缩短了固化时间。

3. 创建集成加热器：



extended pipeline continues to limit the efficiency of core making.

2. Use of a single compact heater:

By combining heating function into a single compact unit and positioning it strategically near the blow hood inlet, heat loss and space requirements are minimized. This approach significantly improves the amine-based product gas temperature at the inlet, enhancing core production efficiency and curing time.

3. Creating an integrated heater:

Mingzhi Technology introduces an innovative integrated heater, combining the air heater and blow hood into a single unit. This eliminates gas transmission pipelines, substantially reducing heat loss and ensuring stable high input gas temperature. With patented technology, this solution achieves remarkable improvements in core making efficiency, reducing curing time and energy consumption significantly.

Comparative testing between the traditional heater concept and the integrated heater solution demonstrates substantial improvements in core curing time and heater power requirements. Test data reveals a remarkable acceleration in curing time and a significant reduction in energy consumption with the integrated heater, underlining its potential to enhance operational efficiency and environmental sustainability.

Mingzhi Technology's innovative integrated heater solution marks a significant advancement in core making technology, offering substantial improvements in efficiency and environmental impact. By addressing inherent challenges in traditional heating methods, this solution not only enhances production outcomes but also aligns with sustainability goals. As Mingzhi Technology continues to drive innovation in core making processes, industries can expect further advancements that optimize production while minimizing environmental footprint.

Explore Mingzhi Technology's integrated heater solution and discover the potential to revolutionize core making processes in your production. Contact us to learn more about implementation options and experience firsthand the transformative benefits of our cutting-edge technology. www.mingzhi-tech.eu tel. +39-3451185845

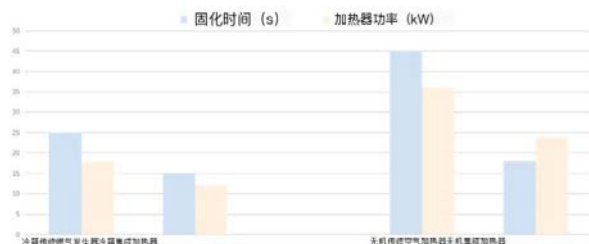
明志科技推出了一种创新的集成加热器，将空气加热器和吹罩组合成一个单元。这消除了输气管道，大大减少了热损失，并确保了稳定的高输入气体温度。凭借专利技术，该解决方案显著提高了制芯效率，显著缩短了固化时间和能耗。

传统加热器概念和集成加热器解决方案之间的比较测试表明，砂芯固化时间和加热器功率要求有了实质性的改善。测试数据显示，集成加热器显著加快了固化时间，显著降低了能耗，突显了其提高运营效率和环境可持续性的潜力。

明志科技创新的集成加热器解决方案标志着制芯技术的重大进步，在效率和环境影响方面有了实质性的提高。通过解决传统加热方法的挑战，该解决方案不仅提高了生产效率，而且与可持续发展目标保持一致。随着明志科技的不断创新，制芯技术将进一步发展，在优化生产的同时最大限度地减少碳足迹。

探索明志科技的集成加热器解决方案，为您的生产挖掘彻底改变制芯工艺的潜力。联系我们，了解更多信息，并亲身体验尖端技术的变革性优势。www.mingzhi-tech.eu 电话: +39-3451185845

制芯工艺	加热器方案	固化时间 (s)	加热器功率 (kW)
冷藏箱	传统燃气发生器	25	18
	集成加热器	15 ↓40%	12 ↓33%
无机物	传统空气加热器	45	36
	集成加热器	18 ↓60%	24 ↓33%



A New Reclamation Plant For "Jobbox Molding Materials" For Additive Manufacturing In A 3D Molding Material Printer With An Electrically Heated Rotary Drum Furnace

一种用于增材制造的“Jobbox 成型材料”的新型回收装置，适用于带有电热转鼓炉的 3D 成型材料打印机

The additive manufacturing of sand cores and sand molds using 3D printing (often with furan binder) is becoming increasingly important in foundries.

Fine new quartz sand is frequently used as a molding material, but other, significantly more expensive molding materials, such as synthetically produced cerabeads, are also used.

The end product—the cast parts to be manufacture—places various demands on the quality of the molding material. At the end of the printing process, the loose, free-flowing "Jobbox molding material" is transported out of the job box with suction devices. In many cases, it is sufficient to sieve the Jobbox molding material to remove coarse components, so it can then be reused in a high percentage for the manufacturing process of the next mold/core parts. A small percentage of the activator usually remains on the grain and is re-wetted with additional activator in the mixer before the 3D printer. Some cast parts with little or no tolerance for gas defects do not allow the use of previously used "Jobbox molding material."

For such Jobbox molding materials, a reclamation plant was designed, developed, and commissioned for and with the highly innovative prototype and small series light metal foundry, Becker CAD, CAM, CAST (Becker CCC) in Steffenberg-Quotshausen. This plant largely removes the activator from the previously used Jobbox molding materials, making it reusable in nearly the same quality as new molding material. Ralf Dehnert, head of small series production at Becker CCC, set the task, precisely defined the necessary process parameters, and significantly influenced the process technology. Martin Dahmann, responsible for special molding materials at Hüttenes Albertus (HA), contributed his knowledge of the synthetic molding material cerabeads used at Becker CCC, and G U T Giesserei Umwelt Technik GmbH handled the plant technology and concept.

使用 3D 增材打印技术（通常使用呋喃粘合剂）生产砂芯和砂型在铸造厂中变得越来越重要。精细的新石英砂经常被用作成型材料，但也会使用其他更昂贵的成型材料，如合成的陶瓷珠。

最终产品——待铸造的铸件——对成型材料的质量提出了各种要求。在打印过程结束时，松散、自由流动的“工作箱成型材料”通过抽吸装置从工作箱中运出。在很多情况下，对 Jobbox 成型材料进行筛分以去除粗糙的成分就足够了，这样它就可以在下一个模具 / 核心零件的制造过程中以很高的比例重复使用。一小部分活化剂通常留在铸件上，并在 3D 打印机的混合器中用额外的活化剂重新润湿。一些对气体缺陷容忍度很低或没有容忍度的铸件不允许使用以前使用的“Jobbox 成型材料”。

对于这种 Jobbox 成型材料，为位于 Steffenberg Quotshausen 的高度创新的原型和小系列轻金属铸造厂 Becker CAD、CAM、CAST (Becker CCC) 设计、开发和调试了一个回收厂。该工厂在很大程度上从以前使用的 Jobbox 成型材料中去除了活化剂，使其能够以与新成型材料几乎相同的质量重复使用。贝克尔 CCC 小批量生产负责人 Ralf Dehnert 设定了任务，精确定义了必要的工艺参数，并对工艺技术产生了重大影响。欧区爱公司 (HA) 特殊模塑材料领域的负责人 Martin Dahmann 贡献了他对贝克尔 CCC 使用的合成模塑材料陶瓷珠的知识，G U T Giesserei Umwelt Technik GmbH 公司负责工厂技术和概念。

从左到右：工厂布局和完整系统

很快就清楚的是，只有一种热处理方式的选择，因此第一步是找到一种合适的电炉，用电加热而不是使用化

left to right: Plant layout and Complete system

It quickly became clear that only a thermal process was an option, so the first step was to find a suitable furnace that was heated electrically rather than using fossil fuels. The choice fell on a hinged-tube rotary drum furnace made in Germany, which fulfils all the criteria. Regeneration tests carried out with a test furnace at the manufacturer's premises were successful right from the start; the job box moulding material regenerated on a trial basis could be successfully reused in the Becker CCC 3D printer.

The plant has the following essential components:

- Feeding area for 4 approx. 1m³ transport containers
- Furnace charging device
- hinged tube rotary drum furnace
- Fluidised bed cooling separator
- Angular bucket elevator
- Vibrating sieve station
- Discharge area to approx. 1m³ transport container
- The throughput capacity is 75 kg of moulding material per hour.

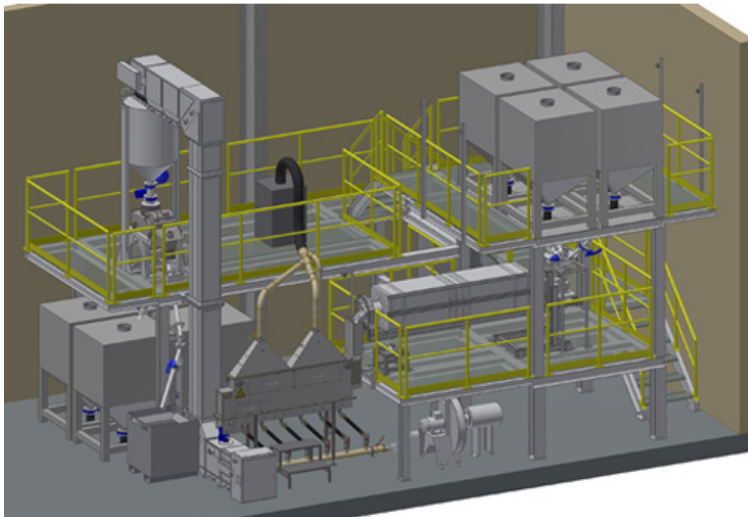
Michael Becker, the managing partner of Becker CCC, believed in the success of the overall concept and provided the funds for the prototype. And rightly so, because the system runs successfully and regenerates - around the clock on working days in semi-automatic mode - job box moulding material that can be easily reused in the 3D printer. ■

石燃料。选择了德国制造的铰接管转鼓炉，该炉符合所有标准。在制造商的工厂用试验炉进行的回收试验从一开始就很成功；在试验基础上再生的作业箱模制材料可以在 Becker CCC 3D 打印机中成功重复使用。

该工厂有以下基本组成部分：

- 4 个约 1m³ 运输容器的进料区
- 炉膛装料装置
- 铰管式转鼓炉
- 流化床冷却分离器
- 角斗式提升机
- 振动筛站
- 卸货区至约 1m³ 运输集装箱
- 生产能力为每小时 75 公斤模塑材料

Becker CCC 的合伙人 Michael Becker 相信整体概念的成功，并为原型提供了资金。这是正确的，因为该系统成功运行，并在半自动模式下在工作日全天候工作，job box 造型材料可以很容易地在 3D 打印机中重复使用。■





企业名称: 上海强振电机设备有限公司
SHANGHAI QIANGZHEN MOTOR EQUIPMENTS CO.,LTD
浙江凯露振动电机有限公司
ZHEJIANG KAILU VIBRATION MOTOR CO.,LTD

姓 名: 王华宇

职 务: 总经理

振动协会会员



抖音号: shqzjdj666



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上海强振电机设备有限公司是(原浙江临海电机厂)国企单位改制后的一家私人企业,也是国内最早生产振动电机厂家,至今专注于YZO-系列老国标振动电机,30年的生产经验,多年来公司一直坚持“追求卓越”的企业宗旨和与“客户共谋发展”的经营理念。

Shanghai Qiangzhen Motor Equipment Co., Ltd. is a private enterprise transformed from a former state - owned enterprise (the original Zhejiang Linhai Motor Factory). It is also one of the earliest manufacturers of vibration motors in China. Up to now, it has been focusing on the YZO - series vibration motors that comply with the old national standards, with 30 years of production experience. Over the years, the company has always adhered to the corporate purpose of "Pursuing Excellence" and the business philosophy of "Seeking Common Development with Customers".

主营产品 YZO系列振动电机 国标产品
MAIN PRODUCTS YZO series vibrating motor, national standard product

企业资质
Enterprise qualification



YZO-5-2/0.25kw



YZO-20-4/0.75kw



YZO-50-6/0.37kw



YZO-300-6/24kw



YZO-500-6/36kw



YZO-8-6/0.55kw



YZO-20-4/1.1kw



YZO-30-4/1.5kw



YZL-75-4/5.5kw



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热线电话: 021-52705736

业务电话: 131-2058-4928

Company Address: No.121, Lao Zhen Bei Road, Shanghai

Production Address: No.87 Jingjiang South Road, Linhai City, Taizhou, Zhejiang Province

Hotline: 021-52705736

Business Phone: 131-2058-4928



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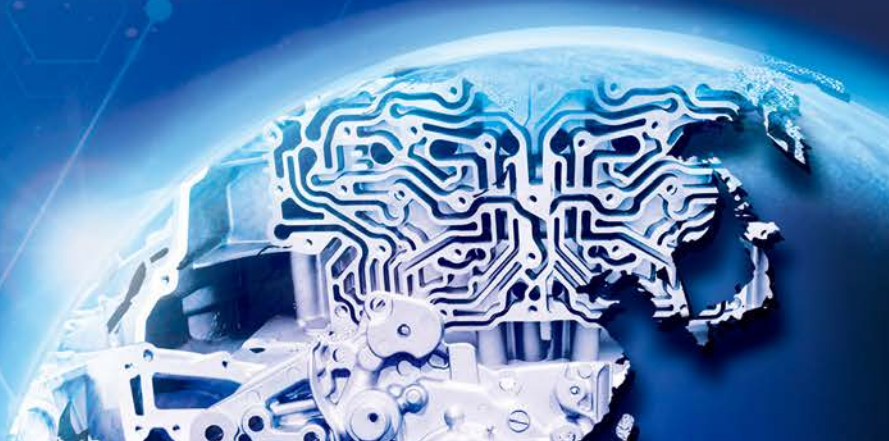
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第十九届中国国际压铸工业展览会
The 19th China International Die Casting Industry Exhibition

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