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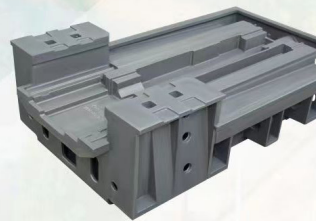
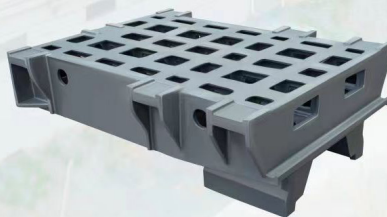
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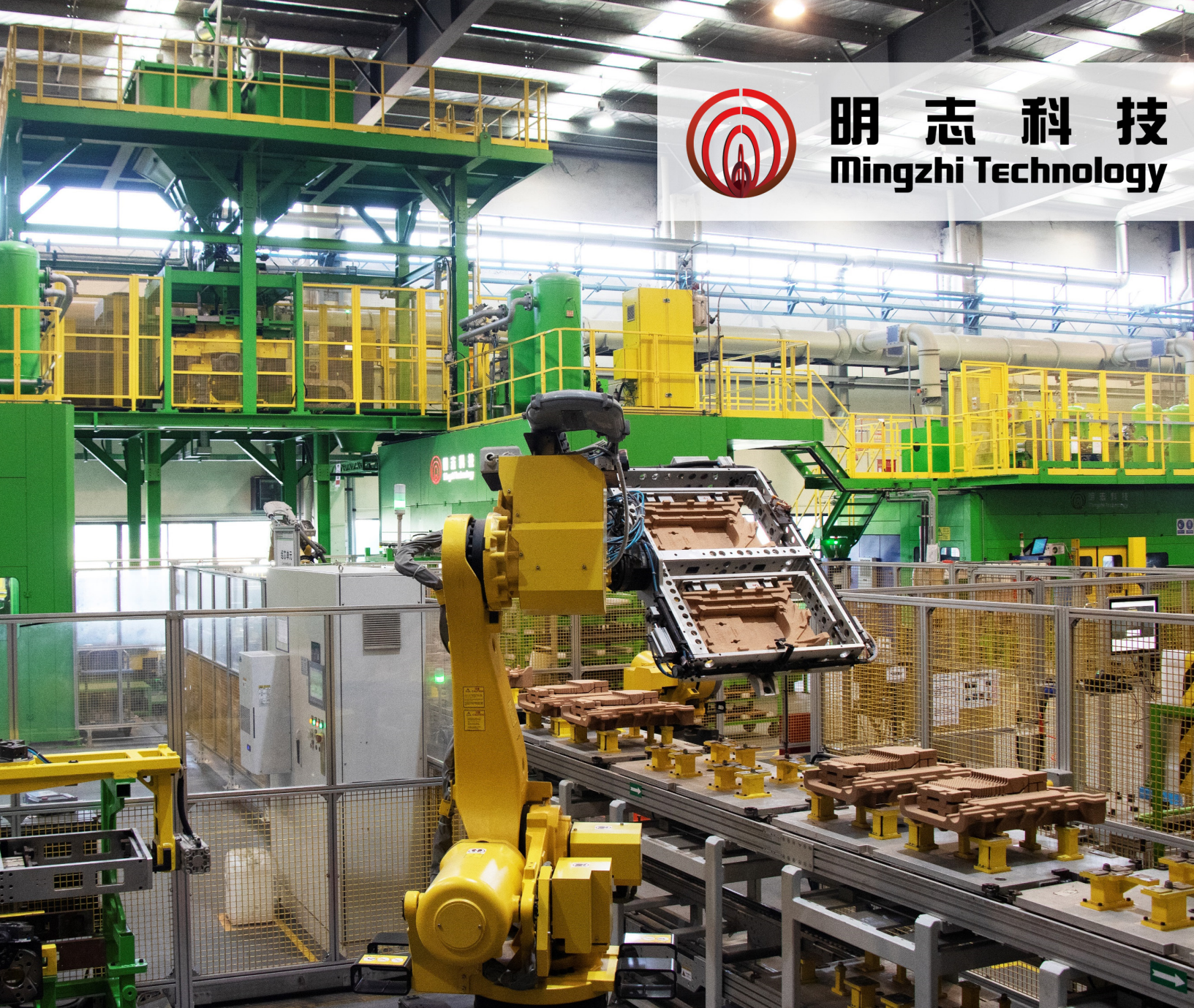
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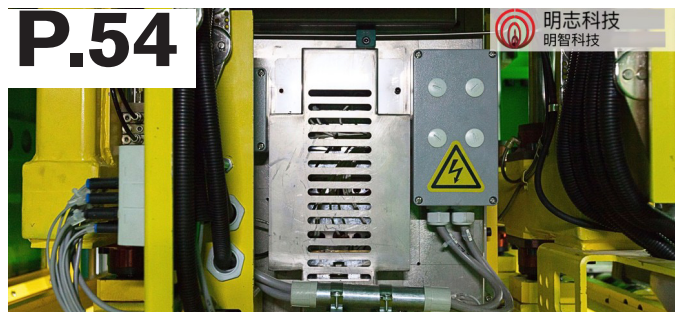
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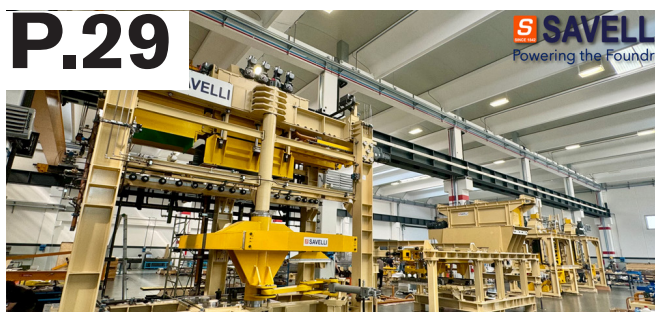
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Key Components of the 5600mm Thick Rolling Mills Have Been Successfully Assembled

5600mm 宽厚板粗轧机关键件制造完成并成功装配

Recently, CITIC Heavy Industries successfully completed the manufacturing process and assembly of key components for the "King of Rolling Mills" 5600mm thick plate roughing rolling mills, which will be used for the wide and thick plate production line project at Zhoukou Iron and Steel Base of Henan Iron and Steel Group. This project is a key project for Henan Iron and Steel Group's structural adjustment, transformation and upgrading, and promoting high-quality development.

During its production, the most critical and most difficult ones are the rolling mill memorial archway and the backup roll. The two memorial archway were successfully poured on October 9 and November 17, 2023, respectively. The single memorial archway is 16.32m high, and it is cast by the 7-ladle steel hydration casting process; The diameter of the supporting roller is 2.4m and the total length is 11.63m, making it the largest supporting roller in the world. It adopts the "domestic design+manufacturing" mode for the first time. Previously, domestic wide and thick plate rolling mills with a diameter of over 4300mm all adopted foreign technology. After the completion, the annual production capacity of the production line can reach 2.6 million tons, which is used to meet the steel demand for high-end sheet metal in marine engineering, shipbuilding, new energy, engineering machinery and other industries, and has attracted industry attention. In recent years, CITIC Heavy Industries has developed a high-end heavy equipment manufacturing process system with 18500 ton free forging hydraulic press as the core, including metallurgy, forging, heat treatment, iron casting, machining for heavy machinery, etc..

Based on the leading high-end equipment manufacturing strength in the world, CITIC Heavy Industry manufactured key products, such as the 5600mm wide and thick plate roughing mill and the 3800mm wide and thick plate rolling mill in 2024. Among them, the 3800mm wide and thick plate rolling mill has been successfully delivered.

Source: CITIC Heavy Industry. ■

近日，中信重工顺利完成“轧机之王”5600mm宽厚板粗轧机关键件的制造流程并成功装配。该5600mm宽厚板粗轧机将用于河南钢铁集团周口钢铁基地宽厚板生产线项目，该项目是河南钢铁集团结构调整、转型升级、促进企业高质量发展的关键项目。

在其生产过程中，最为关键的、制造难度最大的当属轧机牌坊和支承辊，两片牌坊分别于2023年10月9日、11月17日成功浇注，单片牌坊高达16.32米，采用7包钢水合浇工艺铸造；支承辊直径2.4米，总长度11.63米，是目前世界上规格最大的支承辊。这种超大规格的宽厚板轧机采用“国内设计+国内制造”的模式尚属首次。此前，国内4300mm以上的宽厚板轧机均采用的是国外技术。该机组建成后产线年能力可达260万吨，用于满足海工、造船、新能源、工程机械等高端板材用钢需求，颇受业内关注。近年来，中信重工打造了以18500吨自由锻造油压机为核心，包括重型冶铸、重型锻造、重型热处理、重铸铁业、重型机加工等在内的全球稀缺的高端重型装备制造工艺体系。

正是基于国内领先全球稀缺的高端装备制造实力，2024年中信重工成功制造5600mm宽厚板粗轧机、3800mm宽厚板轧机等重点产品。其中，3800mm宽厚板轧机已成功交付。

信息来源：中信重工。■

World's First Full-Size Giga Die-Casting Vehicle Body Successfully Produced

全球首件全尺寸整体车身一体化压铸件成功下线

On August 7, 2024, the world's first full-size giga die-

2024年8月7日，全球首件全尺寸整体车身一体化压

casting body was unveiled at the production base of LK Group (Ningbo Hangzhou Bay New Area). This also means that the 10,000 ton dual injection integrated chassis technology has entered the mass production stage.

As the chief engineer and project director of Chery Automobile's die-casting process, Xiao Rong said that after 816 days of scientific research and hard work of the whole technical team and more than 10 partner enterprises, the first full-size giga vehicle body die-casting part has finally been successfully produced. And technological breakthroughs has been made thanks to the technical team in three aspects.

Firstly, to deal with the problems of large volume and long flow path of components, the team conducted rigorous testings, and ultimately chose a high silicon aluminum alloy material route to ensure the high fluidity of the alloy material.

Secondly, the dual injection system faces the challenge of synchronization between the two injection ends. The analysis of asynchronous simulation technology using casting mold flow software shows that double injection deviation within 20 milliseconds will not affect the convergence of casting forming. After repeated testing and debugging in the early stage, the technical team successfully controlled the synchronization deviation of the 800 ton double injection die-casting machine within the target range, and the deviation of the 13000T double injection die-casting machine also reached the target value, ensuring the stability and consistency of the injection process.

Finally, in order to ensure the smooth implementation of the project, Supreium Technology has developed a dual barrel asynchronous simulation module based on its mold flow analysis software "Super Intelligent Casting Cloud", providing strong support for the preliminary mold flow analysis using dual injection technology, ensuring the accuracy and feasibility of mold design and process parameters. ■

铸件下线仪式在力劲集团（宁波杭州湾新区）压铸机生产基地隆重举行。此举也意味着万吨双压射整体底盘技术进入可量产阶段。

作为奇瑞汽车压铸工艺总工程师、项目总负责人的肖榕感慨地说，经过整个技术团队及 10 多家合作伙伴企业长达 816 天的科研攻关和艰苦奋斗，首个全尺寸整体车身一体化压铸件终于成功下线，这一成功的背后，是技术团队在三方面取得的技术突破。

首先，针对零部件体积庞大、流动行程过长的的问题，团队经过严格的试验和筛选，最终选用了高硅的铝合金材料路线，以确保合金材料的高流动性。

其次，双压射系统面临两个压射端同步性的挑战。采用铸造模流软件的双料筒异步仿真技术分析表明，20 毫秒以内的双压射偏差，不会影响铸件成型汇流。经过前期的反复测试和调试，技术团队成功地将 800 吨双压射压铸机的同步偏差控制在目标范围内，而 13000T 双压射压铸机的偏差也达到了目标值，从而确保了压射过程的稳定性和一致性。

最后，为了项目的顺利实施，适创科技在其模流分析软件“智铸超云”的基础上，专门开发了双料筒异步仿真模块。这一创新为采用双压射工艺的前期模流分析提供了强有力的支持，确保了模具设计和工艺参数的准确性和可行性。■



Lizhong and Geely Establish a Joint Innovation Laboratory

立中集团与吉利汽车集团成立联合创新实验室

On October 12, 2024, the 4th Geely Automobile Group Material Technology Exhibition was successfully held in Hangzhou Bay, Ningbo, and Lizhong Group was invited to participate in.

At the meeting, Lizhong Group and Geely Automobile Group jointly established a joint innovation laboratory for advanced aluminum alloy materials for automobiles, and held a plaque unveiling ceremony. The two sides used this laboratory to conduct joint research and development on cutting-edge technologies such as automotive lightweighting and high-performance aluminum alloy materials for automobiles. The leaders of both sides, along with professors and well-known experts in the industry, witnessed this historic moment together.

Lizhong Group was founded in 1984, specializing in three major businesses: recycled casting aluminum alloys, aluminum alloy wheels, and functional intermediate alloy materials. Its products are widely used in various fields such as automobiles, rail transit, consumer electronics, aerospace, food and drug packaging, machinery manufacturing, shipbuilding, 5G communication, and chip packaging. Since its establishment 40 years ago, the group has always adhered to its market positioning as a "global supplier of aluminum alloy new materials and automotive lightweight components". With strong capabilities in processing and using recycled aluminum, as well as a professional and standardized recycling platform for recycled aluminum, it has been committed to promoting the research and application of low-carbon recycled cast aluminum alloys. In the future, Lizhong Group will continue to provide high-end, high-quality low-carbon and environmental friendly aluminum alloy materials for global automotive and component manufacturers. ■

2024 年 10 月 12 日，吉利汽车集团（第四届）材料技术展成功在宁波杭州湾举办，立中集团受邀参加。

会上，立中集团与吉利汽车集团共同成立了汽车用先进铝合金材料联合创新实验室，并举行了揭牌仪式，双方利用这一实验室就汽车轻量化、汽车用高性能铝合金材料等前沿技术进行联合研发。双方领导与众多高校教授及业内知名专家共同见证了这历史性的一刻。

立中集团始创于 1984 年，主营再生铸造铝合金、铝合金车轮和功能中间合金材料三大业务，产品广泛应用于汽车、轨道交通、消费电子、航空航天、食品药品包装、机械制造、船舶、5G 通讯、芯片封装等领域。集团成立四十年来，始终坚持以“铝合金新材料和汽车轻量化零部件全球供应商”为市场定位，凭借强大的再生铝处理和使用能力以及专业和规范化的再生铝回收平台，一直在致力于推动低碳再生铸造铝合金的研发与应用。未来，立中集团将持续为全球汽车以及零部件厂商提供高端、优质的低碳环保铝合金材料。 ■

Magma Signs Cooperation Agreement with Hanoi University of Science and Technology in Vietnam

迈格码与越南河内科技大学签署合作协议

MAGMA, a leading provider of casting simulation software, entered into a strategic partnership with the School of Materials Science and Engineering (SMSE) at Hanoi University of

迈格码是领先的铸造模拟软件提供商，与越南河内科技大学（HUST）材料科学与工程学院（SMSE）建立了

Science and Technology (HUST) in Vietnam. This collaboration marks a significant milestone in fostering collaboration between academia and industry for the upcoming metal casting market in Vietnam.

The signing event was held at the Hanoi University of Science and Technology ("HUST") on March 15th, 2024, the 1st anniversary of the newly created School within HUST. Professor Huynh Trung Hai and Mr. Jan Eilers from MAGMA Engineering Asia-Pacific signed the agreement for the collaboration and the donation of a MAGMASOFT6 license to the university. Duong Duy Thang, the local MAGMASOFT® specialist and Application Manager from Rieckermann Vietnam who will be responsible for the implementation and training was one amongst more than 200 people, members from the industry, other partners of HUST and students and faculty members who attended the event.

The School of Materials Science and Engineering, established nearly a year ago by merging several institutes and departments, is committed to training high-quality human resources, conducting research, and facilitating technology transfer to serve society, particularly in material industries.

Jan Eilers, General Manager of MAGMA Engineering Asia-Pacific, expressed enthusiasm about the collaboration, stating, "We are thrilled to partner with SMSE to advance research and education in casting simulation technology. This collaboration underscores our commitment to supporting the growth and development of the industry in Vietnam."

The partnership between MAGMA and SMSE signifies a joint commitment to advancing innovation, knowledge exchange, and industry-relevant education in Vietnam's materials science and engineering sector. ■

战略合作伙伴关系。此次合作标志着越南金属铸造市场在促进产学研合作方面的一个重要里程碑。

签署活动于 2024 年 3 月 15 日在河内科技大学举行，恰逢新成立的学院成立一周年之际。来自迈格码亚太区的 Huynh Trung Hai 教授和 Jan Eilers 先生签署了合作协议，并向该大学捐赠了 MAGMASOFT6 许可证。Duong Duy Thang 是来自越南 Rieckermann 公司的 MAGMASOFT® 本地专家和应用经理，他将负责安装和培训，共有行业人士、河内科技大学的其他合作伙伴以及学生和教职员工等 200 多人参会。

材料科学与工程学院成立于近一年前，由多个研究所和部门合并而成，致力于为材料行业培养高素质的人才、开展研究、促进技术转让。

MAGMA Engineering 亚太区总经理 Jan Eilers 对此次合作表现出很大的热情，他表示：“我们很高兴与材料科学与工程学院合作，推进铸造模拟技术的研究和教育。此次合作突显了我们支持越南行业增长和发展的承诺。”

迈格码公司及材料科学与工程学院之间的合作关系标志着双方共同致力于推进越南材料科学与工程领域的创新、知识交流和行业相关教育。 ■

Implementing Ecospray in India

印度企业采用 Ecospray

In June 2019, Wollin, a German-based world leader in spraying solutions for the high-pressure die casting industry, made a significant move in the Indian market by implementing its first EcoSpray system for Rane (Madras) Limited – Light Metal Castings India (RML-LMCI). RML-LMCI is based in Hyderabad and a division of the long-established Rane Group, a manufacturer of various auto components established in 1929 and has been producing die cast parts since 2006.

With the goal of improving production in terms of economy, environmental acceptability, and efficiency, RML-LMCI turned to Wollin, who had the expertise and innovative technology to help

2019 年 6 月，总部位于德国的高压压铸行业喷涂解决方案全球领导者沃尔林公司在印度市场采取了重大举措，为印度雷恩（马德拉斯）有限公司的轻金属铸件公司（RML-LMCI）安装了首个 EcoSpray（生态喷涂系统）。RML-LMCI 总部位于海德拉巴，是历史悠久的雷恩集团的一个部门，雷恩集团是一家成立于 1929 年生产各种汽车零部件的制造商，并且自 2006 年以来生产压铸件。

为了提高经济性、环境可接受性和效率方面提高生产，RML-LMCI 求助于沃尔林公司，沃尔林公司拥有专业知

them achieve their objectives.

The EcoSpray system was implemented following close collaboration between RML-LMCI, headed by President Mr. Sundar, and Wollin. Mr. Sundar, who has been in charge of the Units for the last 14 years, had a team of experienced professionals who were focused on the new technology and worked closely with Wollin to exchange all necessary information. This strong partnership between the customer and the supplier was essential to the success of the project.

Results of the implementation

The results of the EcoSpray implementation were immediate and impressive:

The cycle time was reduced from 76 to 69 seconds, and the total spraying time was reduced by 7 seconds.

Consumption of the concentrate was also significantly reduced, with a decrease from 2.8 liters of material at a mixing ratio of 1:100 to just 9ml of pure concentrate

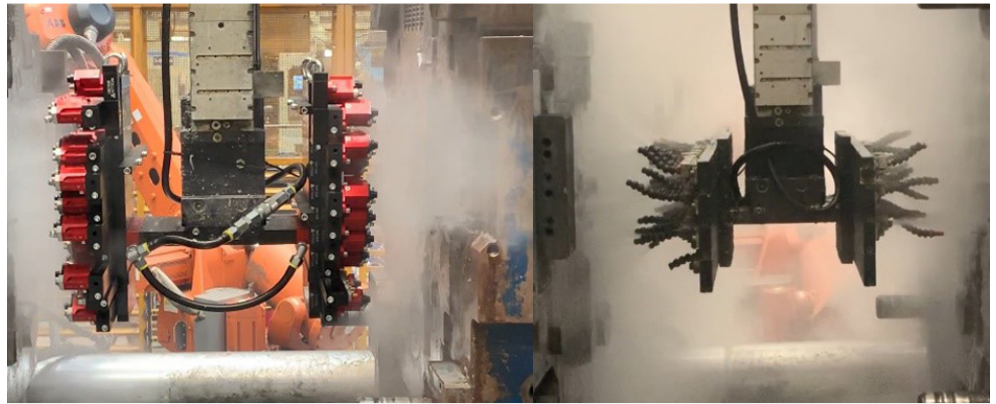
The system also had a positive impact on other key parameters such as energy consumption of heating and cooling units, waste water treatment, and the quality of casting parts, leading to a reduction in the number of rejected parts.

In addition to the short-term benefits, the EcoSpray system also offered long-term advantages. The reduced thermal impact of the system was expected to result in a longer die lifetime, reducing maintenance costs and downtime. And the improvements in efficiency, reduced consumption, and energy savings all added up to significant cost savings for RML-LMCI.

Mr. Sundar was highly satisfied with the results of the pioneering project and stated that he would use the EcoSpray technology in future projects. Wollin, too, is looking forward to a good and prosperous cooperation with RML-LMCI and plans to launch more EcoSpray systems into the Indian market, offering even more benefits to potential customers

Conclusion

In conclusion, the EcoSpray system proved to be an efficient and environmentally friendly solution for die casting foundries looking to improve their production processes. The technology's ability to reduce cycle time, consumption, and energy use, as well as improve casting quality and die lifetime, makes it an attractive solution for foundries looking to reduce their impact on the environment and achieve cost savings. ■



EcoSpray

Conventional Spraying

识和创新技术来帮助他们实现目标。

EcoSpray 生态喷涂系统是在 Sundar 先生领导的 RML-LMCI 和沃尔林公司密切合作后研发的。Sundar 先生在过去 14 年里一直负责这些部门，他拥有一支经验丰富的专业团队，专注于新技术，并与沃尔林公司密切合作，交换所有必要的信息。客户和供应商之间的这种强有力的伙伴关系对项目的成功至关重要。

使用结果

EcoSpray 的使用效果立竿见影，令人印象深刻：

循环周期从 76 秒缩短到 69 秒，总喷涂时间缩短了 7 秒。

精矿的消耗量也大幅减少，从混合比为 1:100 的 2.8 升材料减少到仅 9 毫升纯精矿。

该系统还对其他关键参数产生了积极影响，如加热和冷却装置的能耗、废水处理和铸件质量，从而减少了废品数量。

除了短期效益外，EcoSpray 系统还提供了长期优势。预计该系统的热影响减少将导致更长的模具寿命，降低维护成本和停机时间。效率的提高、节能降耗都为 RML-LMCI 节省了大量成本。

Sundar 先生对该开创性项目的结果非常满意，并表示他将在未来的项目中使用 EcoSpray 技术。沃尔林公司也期待与 RML-LMCI 进行富有成果的合作，并计划向印度市场推出更多 EcoSpray 系统，为潜在客户提供更多利益。

结论

总之，EcoSpray 系统被证明是一种高效且环保的解决方案，适用于希望改进生产工艺的压铸厂。该技术能够减少循环时间、节能降耗、提高铸件质量和模具寿命，使其成为希望减少对环境的影响并实现成本节约的铸造厂的一个有吸引力的解决方案。 ■

3DPTEK Assists in the Rapid Manufacturing of Large-sized Castings

三帝科技 3DP 砂型打印助力大尺寸铸件快速制造



Recently, Xinxin Casting, a subsidiary of 3D Printing Technology Inc. (3DPTEK), successfully delivered an integrated large-size aluminum alloy casting with a diameter of 2.5 meters and a weight of 1 ton to users in the energy and power field using 3DP sand casting. Such a large-sized casting usually takes about 60 days to complete using traditional casting methods, while Xinxin Casting only took 40 days.

In the manufacturing industry, the production of large-sized castings has always been a challenge faced by the industry. The traditional casting method for producing large-sized castings is technically difficult and the production process is cumbersome, which brings many troubles to manufacturers. In response to this situation, 3DPTEK's independently developed 4-meter ultra large 3DP sand mold printer provides a new solution for the industry, which breaks through the size limitations of traditional processing and adopts flexible area forming technology without sand box, supporting local printing. It can form sand molds up to 4 meters in size, thus completing the integrated casting of large-sized and complex structural castings, greatly improving production efficiency and casting quality. More importantly, this equipment is highly cost-effective. While achieving efficient and precise molding, it is also economical and efficient (7-meter equipment accepts pre-orders synchronously). In addition, the company also offers 3DP sand mold printing solutions such as 1.6m and 1.8m to meet the needs of sand molds of different sizes; and also providing open-source materials and processes,

近日，北京三帝科技股份有限公司旗下欣鑫铸造采用 3DP 砂型铸造，为能源动力领域用户成功交付了一体成型的超大尺寸铝合金铸件，该铸件直径达 2.5 米，重达 1 吨。这么大尺寸的铸件，采用传统铸造方式通常需要 60 天左右的时间才能完成，而欣鑫铸造仅用了 40 天即完成交付。

在制造业中，大尺寸铸件的制造一直是行业面临的难题。传统铸造方式制作大尺寸铸件，技术难度大、制作流程繁琐，给制造商带来了诸多困扰。针对这一现状，三帝科技自主研发的 4 米超大尺寸 3DP 砂型打印机为行业提供了新的解决方案。该设备突破传统加工尺寸限制，采用无砂箱柔性区域成型技术，支持局部打印，最大可成型 4 米的砂型，从而完成大尺寸、复杂结构铸件的一体铸造，极大提高了生产效率和铸件质量。更重要的是，该设备极具性价比，在实现高效、精准成型的同时，可经济高效地实现超大尺寸的砂型制造（7 米设备同步接受预定）。此外，公司还有 1.6 米、1.8 米等 3DP 砂型打印机方案可供选择，满足不同尺寸的砂型打印需求；同时提供开源材料工艺，可针对用户按需调整；配套高性能树脂粘结剂、固化剂、清洗剂，保证成型质量和稳定性。

航空航天、船舶、汽车（新能源）、能源动力（电气）

which can be adjusted according to users' needs; equipped with high-performance resin binders, curing agents, and cleaning agents to ensure molding quality and stability.

The aerospace, shipbuilding, automotive (new energy), energy power (electrical) and other fields have an increasing demand for large-sized castings, and strict requirements for product performance and manufacturing cycles. 3DPTEK's casting process has provided customized solutions for large-sized castings to numerous users: it has manufactured power device components with thin-walled, curved, and large planar complex structures that are difficult to achieve with traditional processes for aerospace industry; provide highly airtight enclosures for users in the energy and power industry; efficiently delivered products such as complex curved structure subframe castings and motor housing castings with complex spiral water channels on the inner wall for users in the field of new energy vehicles.

3DPTEK is a provider of 3D printing equipment and rapid manufacturing services, a national level "specialized, refined, unique and new" small giant enterprise, and a typical application scenario supplier for additive manufacturing under the Ministry of Industry and Information Technology. We have both laser and adhesive jet 3D printing equipment, material technology, and application processes. Our business covers the research and production of 3D printing equipment and raw materials, rapid manufacturing services for metal finished products, and 3D printing process technology support services. We have established a complete 3D printing rapid manufacturing industry chain, which is widely used in industries such as aerospace, ship pumps and valves, automobiles, energy and power, industrial machinery, rail transit, 3C electronics, education and research, sculpture and cultural creativity, rehabilitation and medical care.

Source: 3DPTEK ■

等领域具有广泛的大尺寸铸件制造需求，且对产品的性能和制造周期要求严格。三帝科技 3D 铸造工艺，已为众多用户提供了大尺寸铸件的定制化解决方案：为航空航天领域用户制造了传统工艺难以完成的薄壁、曲面及大平面复杂结构的动力装置部件；为能源动力领域用户提供了气密性要求极高的密闭壳体；为新能源汽车领域用户高效交付了复杂曲面结构副车架铸件、内壁带有复杂螺旋水道的电机壳铸件等产品。

北京三帝科技股份有限公司是一家 3D 打印装备与快速制造服务提供商，国家级“专精特新”小巨人企业，工信部增材制造典型应用场景供应商。同时拥有激光和粘结剂喷射 3D 打印设备和材料技术及应用工艺，业务涵盖 3D 打印装备、原材料的研发及生产、金属成品件快速制造服务、3D 打印工艺技术支持服务等，建立了完整的 3D 打印快速制造产业链，广泛应用于航空航天、船舶泵阀、汽车、能源动力、工业机械、轨道交通、3C 电子、教育科研、雕塑文创、康复医疗等行业。

信息来源：三帝科技。■



4米超大尺寸3DP砂型打印机

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The 9th National Foundry Industry Vocational Skills Competition Finals Kicked Off

第九届全国铸造行业职业技能竞赛决赛拉开帷幕

On November 25, 2024, the final of the 9th National Foundry Industry Vocational Skills Competition, which is the "Shengquan Cup", was grandly open in Yutian County, Tangshan City, Hebei Province. It is hosted by China Foundry Association, China Employment Training and Technical Guidance Center, and jointly organized by the Yutian County People's Government, Tangshan Federation of Trade Unions, Tangshan Human Resources and Social Security Bureau, and the Vocational Education Department of China Foundry Association.

209 contestants from 20 provinces and cities across the country (including 41 melting and casting workers, 113 casting and molding (core) workers, and 55 die-casting mold workers) join on the same stage to compete in the final of the 9th National Foundry Industry Vocational Skills Competition, which represents the highest level of technical competition in the national foundry industry and showcasing the skills and style of foundry craftsmen. According to the arrangement of the competition organizing committee, in addition to the main venue located in Yutian County, there are also two sub venues for investment casting and die-casting mold competition in Shunyi, Beijing and Zhuhai, Guangdong, respectively.

China Foundry Association attaches great importance to the construction of high skilled talents for the industry, and always insists on holding vocational skills competitions as an important carrier to strengthen skilled talents. Mr. Zhang Libo, President of China Foundry Association, stated that the association has been persistently organizing national, high-level, and large-scale industry technology competitions, and is willing to provide a broad stage for frontline technical and skilled talents in the industry to carry forward the spirit of craftsmanship, showcase charm, and realize their life value through relevant vocational skills competitions in the foundry industry. ■



2024年11月25日，由中国铸造协会、中国就业培训技术指导中心主办，玉田县人民政府、唐山市总工会、唐山市人力资源和社会保障局、中国铸造协会职业教育部共同承办的2024年“圣泉杯”第九届全国铸造行业职业技能竞赛决赛在河北省唐山市玉田县隆重开幕。

来自全国20个省市的209名参赛选手（其中熔炼浇注工41名，铸造造型（芯）工113人，压铸模具工55人）齐聚一堂、同台竞技，共同参加“圣泉杯”第九届全国铸造行业职业技能竞赛决赛，开启全国铸造行业最高级别的技术比拼，尽情展现铸造工匠技能风采。根据竞赛组委会安排，除玉田主赛场外，在北京顺义和广东珠海，还设有熔模铸造、压铸模具工两个分赛场。

中国铸造协会十分重视行业高技能人才队伍建设，始终坚持把职业技能竞赛作为加强行业技能人才队伍建设的重要载体来抓。中国铸造协会会长张立波在致辞中表示，一直以来，协会坚持不懈地组织开展全国性、高水平、大规模的行业技术大比武，并愿通过支持、参与有关省市地方铸造行业职业技能竞赛活动，为行业一线技术技能人才搭建起弘扬工匠精神、展示竞技风采、实现人生价值的广阔舞台。■

Kangshuo Group's State-of-the-Art Super Factory Officially Commences Operations

康硕集团新超级工厂盛大投产



On November 20th, Kangshuo Group celebrated the official opening of its new ferrous metal production base with a commencement ceremony, signifying a significant stride in the realms of automated, green, digital, and intelligent casting, further solidifying its pivotal role in the manufacturing of critical components.

Core Competitive Edges of the New Super Factory

Cutting-Edge Cold and Hot Core Assembly Automated Production Line: The new facility features a leading-edge cold and hot core assembly automated production line in the domestic industry, realizing a fully automated production process from core making to mold cavity formation, markedly enhancing production efficiency and product quality.

Resin Sand Process for Large and Medium-Sized Castings Production Line: Utilizing the resin sand process, the new facility is capable of producing large and medium-sized castings, catering to a variety of customer needs while ensuring product uniformity and reliability.

Full Range Material Compatibility for Grey Iron, Ductile Iron, and Nodular Iron: The new facility boasts the manufacturing

11月20日，康硕集团新黑色金属生产基地举行投产仪式，正式开启投产，这标志着康硕集团在自动化、绿色化、数字化、智能化铸造领域迈出了坚实一步，进一步巩固了其在关键零部件制造领域的重要地位。

新超级工厂核心优势

先进的冷热芯组型自动生产线：新基地采用了国内领先的冷热芯组型自动生产线，实现了从制芯到型腔的全自动化生产流程，显著提升了生产效率和产品质量。

树脂砂工艺中大型铸件生产线：通过树脂砂工艺，新基地能够生产中大型铸件生产线，满足不同客户的需求，同时保证了产品的一致性和可靠性。

灰铁球铁蠕铁全牌号材料匹配：新基地具备灰铁、球铁、蠕铁全牌号材料的生产能力，为客户提供多样化的产品选择，满足不同工况下的高性能需求。

产线全年设计产能20万吨：新基地产线强大的生产能力确保了康硕集团能够满足市场日益增长的需求。

capability for a comprehensive range of materials, including grey iron, ductile iron, and nodular iron, providing customers with diverse product options to meet high-performance requirements under various operating conditions.

Annual Designed Production Capacity of 200,000 Tons: The robust production capacity of the new facility ensures Kangshuo Group's ability to meet the escalating market demands.

ESG Sustainability Highlights

Automation and Intelligent Systems: The new facility's automated production line is integrated with an intelligent control system, achieving automated control over the production process, and improving production stability and consistency.

Eco-Friendly Manufacturing: Committed to environmentally sustainable production, the new facility employs advanced environmental protection technologies and equipment, achieving energy conservation and emission reduction in the production process, in line with the global trend of green manufacturing.

Digital Management: Through a digital management system, the new facility enables real-time monitoring and data analysis of the production process, enhancing production efficiency and product quality, and providing a scientific basis for decision-making.

Continuous Production Capability: The designed production capacity of the new facility ensures Kangshuo Group's ability to meet customer needs around the clock, maintaining stable supply even during peak market demand periods.

"The inauguration of the new production line is one of the significant milestones in the history of our group's development. It not only enhances our production capabilities but also represents a major achievement on our journey towards automation, greening, digitalization, and intelligence. We will continue to dedicate ourselves to technological innovation and industrial upgrading to provide global customers with higher quality products and services."—Fan Yiyang, President of Kangshuo Group. ■

在 ESG 可持续化上亮点突出

自动化与智能化: 新基地的自动化生产线集成了智能控制系统, 实现了生产过程的自动化控制, 提高了生产稳定性和一致性。

色制造: 康硕集团长期致力于环保生产, 新基地采用了先进的环保技术和设备, 实现了生产过程中的节能减排, 符合全球绿色制造的发展趋势。

数字化管理: 通过数字化管理系统, 新基地实现了生产过程的实时监控和数据分析, 提高了生产效率和产品质量, 为决策提供了科学依据。

持续化生产能力: 新基地的设计产能确保了康硕集团能够全年无休地满足客户需求, 即使在市场需求高峰期也能保持稳定的供应。

“新产线的投产是我们集团发展史上的重要里程碑之一。它不仅提升了我们的生产能力, 更是我们在自动化、绿色化、数字化、智能化道路上的重要成就。我们将继续致力于技术创新和产业升级, 为全球客户提供更优质的产品和服务。”——康硕集团总裁 樊一扬。■



China Foundry Association Attends the 75th World Foundry Congress

中铸协领导一行出席第 75 届世界铸造会议



In order to further provide services and lead the development of the industry, from October 25-28, President of China Foundry Association, Mr. Zhang Libo led a group to attend the "75th World Foundry Congress" and series of activities held in Deyang, Sichuan.

The theme of the 75th WFC is "Developing Foundry", attracting experts, scholars, and industry elites from around the world to participate in the grand event, promoting exchanges and cooperation in foundry technology among countries, driving technological innovation, accelerating the growth of young talents, and making contributions to the overall improvement and sustainable development of the foundry industry.

Since 2000, China's casting production has been ranked first in the world for 24 consecutive years, reaching 51.9 million tons in 2023, accounting for about 45% of the world's total casting production. The development of China's foundry industry plays a pivotal role in the global foundry industry. After years of development, China's foundry industry has made tremendous progress in industrial scale, product quality, technological innovation, green intelligence, and other aspects. There is a long history of the exchange and friendly relationship between China Foundry Association and the World Foundry Organization. Even during the COVID-19, China Foundry Association continued to give strong support to the World Foundry Organization. This session of the World Foundry Congress is the third time held in China. As the co-organizer, China Foundry Association has continued to provide strong assistance to the World Foundry Organization and related activities, serving as a bridge and link for the foundry industry between China and

为进一步做好行业发展的服务与引领，2024 年 10 月 25-28 日，中国铸造协会会长张立波等领导一行出席了在四川德阳举办的“第 75 届世界铸造会议”及系列活动。

本届会议以“发展中的铸造业”为主题，吸引了来自全球铸造领域的专家、学者和业界精英们共襄盛会，促进了各国铸造科技的交流与合作，推动了铸造行业科技创新，加快了青年铸造科技人才成长，为铸造行业整体水平提升和可持续发展做出了贡献。

自 2000 年起，中国铸件产量连续 24 年稳居世界第一，2023 年达到 5190 万吨，约占全球铸件总产量的 45%，中国铸造的发展在全球铸造业中占据着举足轻重的地位。经过多年发展，我国铸造行业在产业规模、产品质量、科技创新、绿色智能等方面取得了巨大的进步，对外扩大交流与合作的需求与日俱增。中国铸造协会与世界铸造组织的交流与友好关系由来已久，即使是在全球新冠疫情期间，中铸协依然持续给予了世界铸造组织大力支持。本届世界铸造会议是世界铸造组织在中国举办的第三届会议，为与世界铸造同仁建立更深层次的交流与互动，作为本届会议的联合承办单位，中铸协一如既往地给予了世界铸造组织及相关活动鼎力协助，做好中国铸造与世界铸造的桥梁和纽带，力争引领中国铸造

the world, and striving to support China foundry to showcase its image and influence on a broader world stage.

With the platform of the World Foundry Congress, colleagues in the global foundry industry have come together, in line with the development trend and based on the common pursuit of all foundrymen. In the context of the global economic slowdown, close communication and cooperation among industry in different countries and regions are even more necessary. China Foundry Association is willing to work hand in hand with colleagues in the foundry industry to continuously promote the sustainable development of the global foundry industry. ■

在更广阔的世界舞台尽情展示独特的风采。

借助世界铸造会议的平台，全球铸造行业同仁走到了一起，这是顺应铸造业发展的大势，更是基于我们铸造人共同的追求。在全球经济发展放缓的大背景下，更需要行业同仁间的密切联络与合作共进，中国铸造协会愿与铸造行业同仁一道，携手并肩，持续推动全球铸造行业的融合发展。■

New Molding Equipment Investment Brings Significant Benefits to Manufacturer's Brass and Aluminum Foundry

新造型线的投资为 MBAF 公司带来了显著效益

Manufacturer's Brass and Aluminum Foundry's (MBAF) investment in the new Sinto FBO-III 20x24 flaskless molding machine with mold handling line and Sinto Smart Foundry integration has brought about significant improvements in their operations.

The integration of Industry 4.0 technologies like the Sinto Smart Foundry system has allowed G&W Electric to enhance their foundry processes, bringing about benefits such as improved safety, efficiency, and quality.

Manufacturer's Brass and Aluminum Foundry, a division of G&W Electric, boasts a rich history spanning over 70 years.

Since 1905, G&W Electric has been a leading provider of innovative power grid solutions including the latest in load and fault interrupting switches; reclosers; sensors; system protection equipment; power grid automation; transmission and distribution cable terminations; and joints and other cable accessories. G&W Electric is headquartered in Bolingbrook, Illinois, U.S.A., with manufacturing facilities and sales support in more than 100 countries, including Canada, Italy, China, Mexico, Brazil, India, UAE and Singapore. G&W helps their customers meet their challenges and gain a competitive edge through a suite of advanced products and technical services.

Having previously invested in Sinto technology back in 1996, with their first Sinto FBO-III, MBAF's decision to partner with Sinto once again reflects their confidence in the brand's capabilities. Through this partnership, G&W Electric has gained access to Sinto Smart Foundry integration, localized support, future growth opportunities, and potential solutions for their evolving needs.

MBAF 公司（黄铜及铝铸造厂）投资了新的新东 FBO-III 20x24 无箱造型线，该设备集成了模具线和 Sinto Smart Foundry（新东智能铸造线），显著提升了运营效率。

新东智能铸造线等工业 4.0 技术的集成使 G&W Electric 公司能够改进其铸造工艺，有助于提高安全性、效率和质量。

G&W Electric 旗下的 MBAF 公司拥有 70 多年的发展历史。

自 1905 年以来，G&W Electric 公司一直是创新电网解决方案的领先供应商，包括最新的负载和故障中断开关、重合器、传感器、系统保护设备、电网自动化、输配电电缆终端，以及接头和其他电缆配件。G & W Electric 公司总部位于美国伊利诺伊州的博灵布鲁克，在加拿大、意大利、中国、墨西哥、巴西、印度、阿联酋和新加坡等 100 多个国家拥有生产厂和销售支持。G&W 公司通过一系列先进的产品和服务帮助客户应对挑战并获得竞争优势。

早在 1996 年，MBAF 公司就投资了新东技术，推出了第一款新东 FBO-III，MBAF 与新东合作的决定再次反映了他们对该品牌能力的信心。通过此次合作，G&W Electric 获得了 Sinto Smart Foundry 的集成、本地化支持、未来增长机会以及满足其不断变化需求的潜在解决方案。



The incorporation of Industry 4.0 technology through Sinto Smart Foundry integration represents a significant leap forward for G&W Electric, taking their foundry to a new level. With real-time monitoring through the Live Production Monitor, G&W engineers can stay informed about their production processes, enabling them to make timely decisions and optimizations. This data is provided immediately and can be completely customizable to the information the operators, shift leads or plant managers need to see.

Derek Wilken, MBAF Maintenance Project Manager, emphasized the various objectives behind the investment, including improving safety, ergonomics, and efficiency, while also enhancing the quality of castings through automation vs. manual handling. The choice of Sinto was driven by considerations such as turnaround time and installation support, underlining the effectiveness of the partnership.

The installation of the new molding equipment and Industry 4.0 technology commenced in November 2023, with MBAF swiftly initiating production just 14 days after installation began. Since then, MBAF has witnessed remarkable improvements, including a doubling of mold production rates, from 40 molds/hour to 80 molds/hour, and a substantial 50% reduction in scrap. Moreover, the elimination of ergonomic and safety issues associated with manual handling has further increased productivity, efficiency and workplace conditions, enabling MBAF to expand their operations and increase revenue.

Sinto expresses gratitude for MBAF's trust in their equipment and is pleased to see the positive outcomes that MBAF has achieved since the installation. By mitigating safety concerns, enhancing reliability and capacity, and addressing quality issues, Sinto anticipates MBAF to continue prospering through the utilization of advanced foundry solutions. ■

通过 Sinto Smart Foundry 集成工业 4.0 技术，G&W Electric 公司实现了重大飞跃，将其铸造厂提升到了一个新的水平。通过实时生产监控，G&W 工程师可以随时了解他们的生产流程，使他们能够及时做出决策和优化。这些数据会立即提供，并且可以完全定制为操作员、值班负责人或工厂经理需要看到的信息。

MBAF 的维护项目经理 Derek Wilken 强调了投资背后的各个目标，包括提高安全性、人体工程学和效率，同时通过自动化与人工搬运来提高铸件的质量。选择新东是出于周转时间和安装支持等考虑，突显了合作伙伴关系的有效性。

新的造型线和工业 4.0 技术的安装始于 2023 年 11 月，MBAF 在安装开始后仅 14 天就迅速投入生产。从那时起，MBAF 公司取得了显著的进步，包括模具生产率翻了一番，从 40 个模具 / 小时提高到 80 个模具 / 时，废品减少了 50%。此外，消除了与人工搬运相关的人体工程学和安全问题，进一步提高了生产力、效率和工作场所条件，使 MBAF 公司能够扩大业务并增加收入。

新东公司对 MBAF 公司对其设备的信任表示感谢，并很高兴看到 MBAF 公司自安装以来取得的积极成果。通过减轻安全风险、提高可靠性和产能、解决质量问题，新东公司预计 MBAF 公司将通过使用先进的铸造解决方案继续蓬勃发展。■

Bigger Is Better, The Biggest Is The Best

越大越好，最大最优

Loramendi & Aurrenak lead the superior solutions of the foundry industry, such as the world's largest core making machines and tooling for the production of the world's largest cores.

With over five decades of experience, their large projects define Loramendi & Aurrenak Group as pioneers in creating the largest machines, setting the record straight - bigger may be better, but when it comes to excellence, the biggest is the best.

Certainly, here are examples showcasing the references and capabilities of their large core making machines, ranging from a blowing capacity of 350 liters up to 2.500 liters, with a maximum tooling size of 2.800 x 2.800 mm, enabling their customers to manufacture sand cores weighing up to 4.000 kg in a single blow.

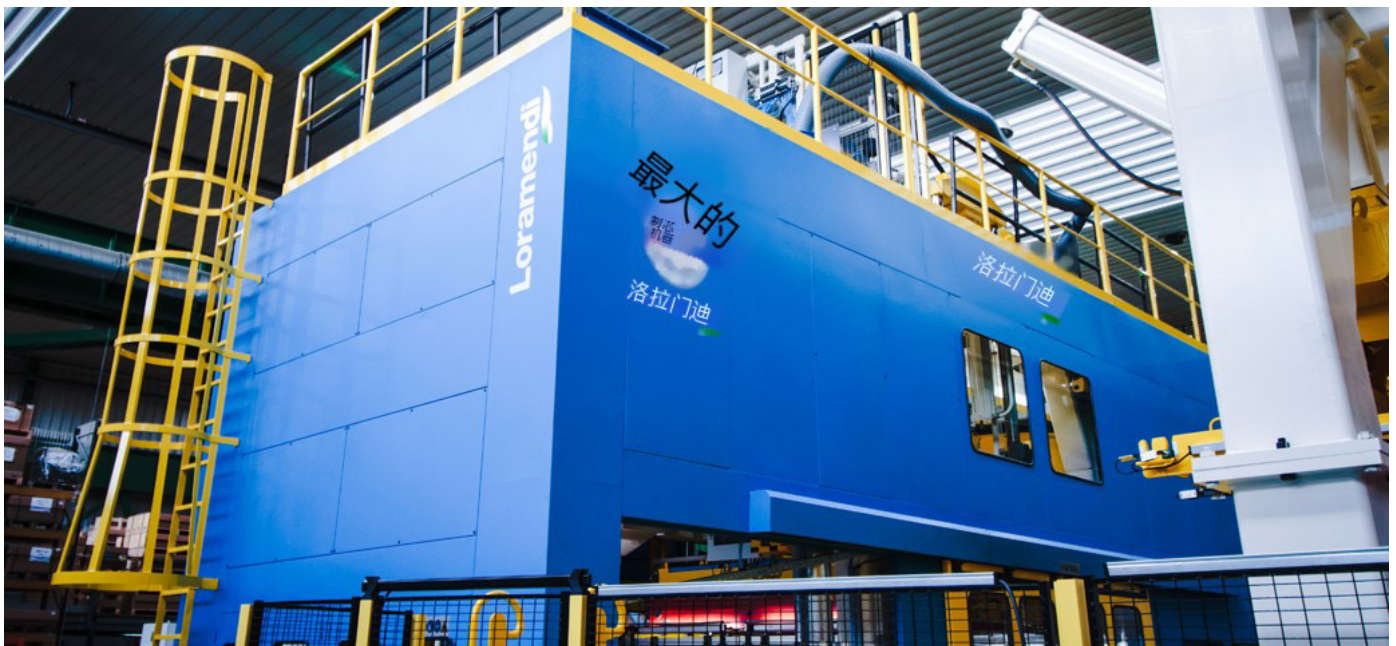
Each project is not just a technological masterpiece, but a reflection of their determination to redefine the limits of what is possible. Because when it comes to shaping the future, size isn't just a matter of scale - it's proof of the continued commitment to being the best partner for the foundry industry. ■

Loramendi&Aurrenak 引领铸造行业发展，提供卓越解决方案，例如他们拥有世界上最大的制芯机和用于生产世界上最大型芯的模具。

凭借 50 多年的生产经验，他们的大型项目将 Loramendi&Aurrenak 定义为创造最大机器的先驱，创下了纪录——更大更好，但说到卓越性，最大的就是最好的。

当然，这里有一些例子展示了他们的大型制芯机的参数和能力，从 350 升到 2500 升的吹气能力，最大模具尺寸为 2800x2800 毫米，使他们的客户能够一次吹制重达 4000 公斤的砂芯。

每个项目不仅是一个技术杰作，更反映了他们重新定义极限可能性的决心。在塑造未来方面，不仅仅是设备大小的问题，更是公司继续致力于成为铸造行业最佳合作伙伴的决心。■



GIGA Presses As Innovation Drivers In Key Industrial Sectors

大型压铸机是关键工业领域的创新驱动力

The call for giga presses is getting louder: companies in the plastic injection molding and light metal die-casting sectors are developing ever larger and more complex machines to meet the new requirements for the supply of components from various industries. This affects the entire value chain upstream. Foundries such as Krefeld's Siempelkamp Giesserei are needed for the production and availability of the extremely thick-walled structural components required for the high-tech machines within this value chain. Therefore, they are also noticing the changes.

"Whether in the aerospace industry, consumer electronics or the automotive industry—the machines used for the production of state-of-the-art components from these industries are becoming more and more complex and gigantic. As a result, our customers' requirements for the structural components they need are also becoming more demanding," says Dirk Howe, Managing Director of Siempelkamp Giesserei. "It is both our aspiration and our commitment to always respond to the new requirements of machine builders and to provide custom-fit casting solutions."

The development becomes clear above all in the example of electric mobility. Driven by the need for sustainable mobility, there is still a high demand for electric vehicles. Automotive companies are using highly complex light metal die-casting structures for the production of these instead of laboriously assembling a large number of individual parts. As a consequence, this leads to an

行业对大型一体化压铸机的呼声越来越高：塑料注塑和轻金属压铸行业的企业正在研发更大、更复杂的机器，以满足各行业对零部件的新要求。这会影响到整个上游价值链。Krefelds Siempelkamp-Giesserei 等铸造厂需要生产和提供该价值链中高科技设备所需的极厚壁结构部件。他们也注意到了这些变化。

Siempelkamp Giesserei 董事总经理 Dirk Howe 表示：“无论是在航空航天、消费电子行业还是汽车行业，用于生产这些行业最先进部件的设备都变得越来越精密和庞大。因此，我们的客户对所需结构部件的要求也越来越高。始终满足机器制造商的新要求，并提供定制的铸件解决方案，是我们的愿望和承诺。”

首先，以电动汽车为例，该领域的发展变得清晰起来。在可持续绿色出行需求的推动下，电动汽车的需求仍然很高。汽车公司正在使用高度复杂的轻金属压铸设备来生产这些零部件，而不是费力地组装大量的单个零件。因此，这大大提高了效率，节省了重量、成本和时间。然而，如果没有像 Siempelkamp 公司制造的大型结构部件，尤其是能够承受最大载荷的部件，轻金属压铸解决方案将是不可能的。



enormous increase in efficiency and saves weight, costs and time. However, light metal die-casting solutions would be inconceivable without the massive structural components made by foundries especially Siempelkamp, which can withstand the greatest of loads.

"The impressive plates, which we cast in our foundry for highly complex horizontal presses, can achieve a final raw casting weight of over 150 tons. Only with the help of our maximum tough castings the high-tech machines can form corresponding components with a pressing force of up to 11,000 tons," says Dr. Georg Geier, also managing director of Siempelkamp Giesserei. "With our expertise and know-how in casting, we are actively shaping the future in this way. Therefore, our daily motivation is: Advantage through casting—casting is our passion." ■

Siempelkamp 铸造公司的董事总经理 Georg Geier 博士说：“我们在铸造厂为高度复杂的卧式压力机生产的令人印象深刻的板材，可以实现超过 150 吨的最终原始铸件重量。只有在我们最坚固的铸件的帮助下，高科技机器才能以高达 11000 吨的压力生产出所需的部件。凭借我们在铸造方面的专业知识和技艺，我们正在积极塑造未来。因此，我们的动力是：通过铸造获得优势——铸造是我们的激情所在。” ■

P.S. AUTO GRINDING'S EUROPEAN EXPANSION AND A NEW PARTNERSHIP

P.S. AUTO GRINDING 公司扩展欧洲市场 建立新的伙伴关系

The modern foundry works with the faster, safer, and consistent robotic grinding centre from Koyama. All equipment and spare parts stock are based in Germany to ensure next day delivery within Europe. Now the company forged a new partnership with the Chinese manufacturer WEIJING for hydraulic wedges and impactors.

With more than twenty years of experience in finishing foundry parts by using Koyama automatic grinding centers, P.S. Auto Grinding is recognized for its commitment to quality and efficiency of its products and services. This enabled the company to build a reputation of trust and reliability.

P.S. Auto Grinding well understands the challenges faced by its foundry clients and strive to provide reliable solutions tailored to their needs. Over the years, the company had expanded its wide range of machines to include a selection of accessories customized to its requirements for robustness and performance, which its clients are accustomed to.

P.S. Auto Grinding's machines can be complemented by numerous options

Throughout its history, the company proofed several

一个现代的铸造厂与 Koyama 的更快、更安全、更稳定的机器人研磨中心合作。所有设备和备件库存均位于德国，确保第 2 天即可实现欧洲境内的交付。现在，该公司与中国制造商微晶公司建立了新的合作伙伴关系，生产液压楔和冲击锤。

P.S.Auto grinding 在使用 Koyama 自动研磨中心精加工铸造零件方面拥有二十多年的经验，因其对产品和服务质量和效率的承诺而受到客户认可。这使公司获得了信任并赢得了可靠的声誉。

P.S.Auto Grinding 非常了解其铸造客户面临的挑战，并努力提供适合其需求的可靠解决方案。多年来，该公司扩大了机器范围，包括根据客户习惯的坚固性和性能要求定制的一系列配件。

P.S.Auto Grinding 的机器有多种选择进行完善

历史证明，公司能够适应不断变化的市场需求，同时保持其生产效率和无与伦比的可靠性的基本价值

times being able to adapt to changing demands while remaining true to its fundamental values of efficiency and unmatched reliability. Today, P.S. Auto Grinding's machines can be complemented by numerous options, including extraction conveyors and robot loading cells.

New partnership with the Chinese manufacturer WEIJING for hydraulic wedges and impactors

«In response to several clients' requests, we have sought to enhance our offerings to become the specialist in part finishing across Europe. After a six-month extensive test in a reputable UK foundry, we have forged a new partnership with the Chinese manufacturer WEIJING for their hydraulic wedges and impactors, facilitating the separation of casting parts from their gating system. We have worked to upgrade this equipment to our standards to ensure our customers receive the same level of reliability and after-sales service that P.S. Auto Grinding is renowned for”, so Paul & Christopher Smith.

About P.S. Auto Grinding

Founded in 2001, PSAG is the exclusive European distributor for the Koyama range of robotic grinding centres. The company supplies iron and non-ferrous foundries and offer free trials, giving prospective buyers accurate cycle times to calculate a justification package. With a machine range designed to handle castings from less than 1 kg to over 300 Kgs in both manual and turn-table versions, PSAG offer machines to suit almost every application in the Cast Iron, Nodular Irons, Aluminium, Copper and Brass cast Industries. In 2016, PSFT (P.S. Foundry Tech GmbH)

观。如今，P.S.Auto Grinding 公司的机器可以通过多种选择进行补充搭配，包括提取输送机 and 机器人装载单元。

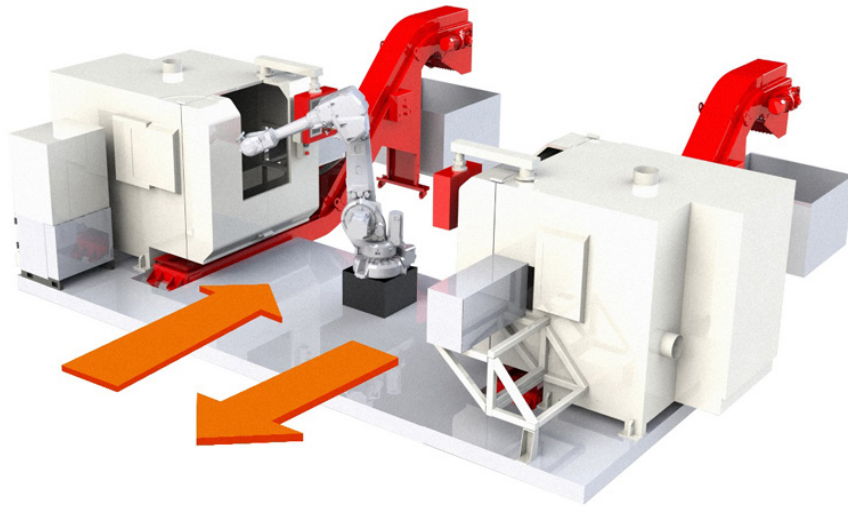
与中国制造商微晶公司建立液压楔块和冲击锤的合作伙伴关系

Paul&Christopher Smith 表示：“应客户要求，我们寻找新的合作伙伴，希望成为欧洲零件精加工的专家。在一家声誉良好的英国铸造厂进行了为期六个月的广泛测试后，我们与中国制造商微晶公司就其液压楔和冲击锤建立了新的合作关系，促进了铸件与浇注系统的分离。我们一直致力于将该设备升级到我们的标准，以确保我们的客户获得与 P.S.Auto Grinding 具有同等声誉的服务水平和售后服务。”

关于 P.S.Auto Grinding 公司

PSAG 成立于 2001 年，是 Koyama 系列机器人研磨中心的欧洲独家经销商。该公司服务于铸铁和有色金属铸造厂，并提供免费试用，为潜在买家提供准确的周期时间来计算需求。PSAG 的机器用于处理从小于 1 公斤到超过 300 公斤的铸件，包括手动和转盘机器，PSAG 提供的机器几乎适用于铸铁、球墨铸铁、铝、铜和黄铜铸造行业的所有应用。2016 年，PSFT (P.S. Foundry Tech GmbH) 成立，可以为德语市场提供更好的支持。2019 年，PSFT 在杜塞尔多夫附近的新基地继续发展壮大。





was founded to provide better support to the German-speaking markets. 2019 PSFT continued to grow from its new base near Dusseldorf (The 700 square meter unit is available for trials and spares storage.) In 2023 the company undertook an identity Realignment of PS FoundryTech GmbH: The subsidiary's Name Transition to PS AUTO GRINDING GmbH to strengthen the DNA of the PS AUTO GRINDING Brand. ■

大(700 平方米的厂房可用于试验和备件储存)。2023 年, 该公司对 PS FoundryTech GmbH 进行了调整: 子公司名称转换为 PS AUTO GRINDING GmbH, 以加强 PS AUTO GRIND 品牌基因。■

Voxeljet Ag: The Management Of Voxeljet Ag Is Repositioning Itself

Voxeljet Ag: 公司管理层重新调整

Dr. Ingo Ederer leaves the Management Board as of June 30, 2024

Ingo Ederer 博士于 2024 年 6 月 30 日离开管理层

Dr. Ingo Ederer, founder of the company, will complete his contract as CEO and member of the Management Board as of June 30, 2024. Dr. Ingo Ederer will continue to be available to the company in an advisory capacity to ensure a smooth transition.

"I look back proudly on the last 25 years, during which voxeljet has celebrated numerous successes," explains Dr. Ederer. "The past year has been the most successful in the history of our company, and this would not have been possible without the dedication and hard work of our entire team. I am now looking forward to supporting my colleagues as they continue the company's growth journey."

Rudolf Franz, who was previously the Chief Financial Officer, will serve as CEO and lead the company together with the extended management team. "I would like to thank Ingo for

公司创始人 Ingo Ederer 博士作为首席执行官兼管理委员会成员的合同于 2024 年 6 月 30 日到期。Ingo Ederer 博士将继续以顾问身份为公司服务, 以确保平稳过渡。

Ederer 博士说: "回顾过去的 25 年, voxeljet 取得了很大的成功, 我感到非常自豪。过去的一年是我们公司历史上最成功的一年, 如果没有我们整个团队的奉献和努力, 这是不可能的。现在, 我将继续支持我的同事们, 实现公司的持续增长。"

前首席财务官 Rudolf Franz 将担任首席执行官, 并与扩大的管理团队一起领导公司。Rudolf Franz 解释说: "我要感谢 Ingo Ederer 博士在过去 20 年里的信任合作, 并期



the trusting cooperation over the past 20 years and look forward to his support in the future," explains Rudolf Franz.

The Supervisory Board would like to thank Dr. Ederer for his many years of tireless commitment to developing voxeljet into a leading provider of 3D printing technologies. The Supervisory Board commends Rudolf Franz at his selection as the next CEO of voxeljet, where he will contribute his extensive knowledge of all aspects of voxeljet, including the Company's technologies, markets and strategic roadmap to grow voxeljet's global business.

What's about voxeljet's vision and projects?

The vision is and remains to establish a new production standard, as we have been told by the company.

In 2022, we reached an important milestone with the successful commissioning of the ICP project at the BMW Group plant in Landshut. Here, we print hundreds of thousands of casting cores fully automatically. Our goal is to achieve the same in other markets and also with our VX1000 HSS.

In another major project, we are developing a new casting cell for wind energy components weighing up to 60 tons as part of a research consortium led by GE Renewable Energy - now GE Vernova. This includes the implementation of the giant VX9000 3D printer, which is currently under construction. The system will later be able to print around 300 tons of material so that it can be used for the production of wind turbine parts such as the nacelle, among other things.

As far as the cold IOB technology announced in 2023 is concerned, we have seen a steady increase in demand for inorganic binders. We are also working with inorganic binders in the ICP project, but it is a hot IOB process where the printed parts need to be cured in a microwave after printing. Cold IOB technology, which does not require a microwave, is currently being optimized to achieve thinner tolerances and stability during casting. However, we have received very positive feedback from customers.

待他未来的支持。”

监事会感谢 Ederer 博士多年来不懈地致力于将 voxeljet 发展成为领先的 3D 打印技术供应商。监事会赞扬 Rudolf Franz 被选为 voxeljet 的下一任首席执行官，他将贡献他对 voxeljet 各个方面的广泛知识，包括公司的技术、市场和发展全球业务的战略路线图。

voxeljet 的愿景和项目是什么？

正如我们说的那样，我们的愿景仍然是建立一个新的生产标准。

2022 年，我们在兰茨胡特宝马集团工厂成功调试了 ICP 项目，这是一个重要的里程碑。在这里，我们全自动打印了数十万个铸造芯。我们的目标是在其他市场以及 VX1000 HSS 上实现同样的目标。

在另一个重大项目中，我们正在为重达 60 吨的风能组件开发一种新的铸造单元，这是由通用电气可再生能源公司（现为通用电气 Vernova）领导的研究联盟的一部分，包括目前正在建设中的巨型 VX9000 3D 打印机的安装。该系统稍后将能够打印约 300 吨材料，以便用于生产风力涡轮机零件，如机舱等。

就 2023 年宣布的冷芯 IOB 技术而言，我们看到对无机粘合剂的需求稳步增长。我们还在 ICP 项目中使用无机粘合剂，但这是一个热芯 IOB 工艺，打印后的部件需要在微波炉中固化。冷芯 IOB 技术不需要微波，目前正在进行优化，以在铸造过程中实现更薄的公差和稳定性。然而，我们收到了客户非常积极的反馈。

In the on-demand printed parts sector, we have seen the emergence of new and innovative applications for our technology in recent years, particularly in the architectural and art markets. We are also seeing more and more customers ordering larger quantities of large parts due to the 'gigacasting' trend. This is where our technology excels and offers our customers significant advantages in terms of scalability and cost per part. Our primary goal is to meet these demands and increase productivity by extending the scope of Binder Jetting and our HSS technology to serial production.

About Voxeljet

voxeljet's roots reach back to the year 1995 with the first successful dosing of UV-resins. In the context of a "hidden" project, initial 3D-printing tests are performed at the Technical University Munich. Our company was founded on May 5, 1999 as a spin-off from TUM in Munich with a clear vision in mind: to establish a new manufacturing standard by developing new generative processes for the series-production of complex components using 3D printing. In the beginning, operations are launched with four employees at the TUM. Today, we are a globally acting, leading provider of high-speed, large-format 3D printers and on-demand 3D printed parts to industrial and commercial customers. Components manufactured with the help of our technology are flying in space, make mobility more efficient and the production of new engineering solutions possible. Visit our website www.voxeljet.com, and follow us on LinkedIn, or on Twitter. ■

在按需打印部件方面，近年来，我们研发出了新的创新应用，特别是在建筑和艺术铸件市场。由于一体化大型铸造的趋势，我们也看到越来越多的客户订购了大量的大型零件。这就是我们技术的优势所在，在可扩展性和每个零件的成本方面为客户提供了显著的优势。我们的主要目标是通过将粘结剂喷射和 HSS 技术的范围扩展到批量生产来满足这些需求并提高生产率。

关于 Voxeljet 公司

voxeljet 公司的起源可以追溯到 1995 年，当时首次成功地使用了 UV 树脂。在一个秘密项目的背景下，慕尼黑工业大学进行了初步的 3D 打印测试。公司成立于 1999 年 5 月 5 日，是慕尼黑 TUM 的分拆公司，有着清晰的愿景：通过开发新的生产工艺，使用 3D 打印批量生产复杂部件，建立新的制造标准。最初，TUM 有 4 名员工。如今，我们是一家全球领先的供应商，为工业和商业客户提供高速、大型 3D 打印机和按需定制化 3D 打印。借助我们的技术生产的组件已应用于太空飞行，使移动性更加高效，并使新的工程解决方案成为可能。访问公司网站 www.voxeljet.com，或在领英或推特上关注我们。■



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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The Redesign Of The ATIK Metal Foundry Plant In Aliaga, Turkey

土耳其阿利加 Atik 金属铸造厂的重新设计

The redesign of the ATIK METAL foundry plant in Aliaga, Turkey, is one of the largest orders in the 30-year history of VHV Anlagenbau GmbH. As a renowned manufacturer of belt conveyor systems and specialist in steep conveyor technology, VHV was selected to supply customized solutions of the highest quality for this major project.

Cooperation and partnership

When selecting suppliers, owner and managing director Mehmet Atik focused on the highest quality and smooth interfaces. The cooperation with companies such as VHV Anlagenbau GmbH, Eirich official | Maschinenfabrik Gustav Eirich GmbH & Co KG, Heinrich Wagner Sinto Maschinenfabrik GmbH and JOEST group was decisive for the success of the project. Thanks to the long-standing partnership and trusting cooperation, innovative solutions were developed and implemented.

Project scope and implementation

The project comprised the development and implementation

位于土耳其阿利加的 ATIK METAL 铸造厂的重新设计是 VHV Anlagenbau GmbH 30 年历史上最大的订单之一。作为著名的带式输送机系统制造商和垂直输送机技术专家，VHV 为这一重大项目提供最高质量的定制解决方案。

合作伙伴关系

在选择供应商时，公司所有者兼董事总经理 Mehmet Atik 专注于高质量和流畅的沟通。与 Eirich official | Maschinenfabrik Gustav Eirich GmbH & Co KG VHV Anlagenbau GmbH、Heinrich Wagner Sinto Maschinenfabrik GmbH、JOEST 集团等公司的合作对项目的成功起到了决定性的作用。得益于长期信任的合作伙伴关系，我们制定并采用了创新的解决方案。

项目范围和实施

of a state-of-the-art foundry system that met the market requirements for ever larger castings. Close coordination and quick decision-making in team meetings led to optimizations in the project process. The involvement of Mehmet Atik in the meetings enabled immediate clarification and the rapid implementation of suggestions for improvement.

Technical details and equipment

The foundry plant has impressive dimensions, with factory halls 350 metres long, 120 metres wide and a 24 metre high compact plant in the central preparation area. The plant is equipped with state-of-the-art technology, including 4 Eirich mixers in the Evactherm® system, the HWS 5 and HWS 6 moulding plants and 4 electric furnaces for melting molten iron.

Another important aspect is the sustainability of the project, as a large proportion of the material melted down is reused from scrapped ships.

With the HWS6, ATIK METAL may not have quite the largest moulding boxes in Turkey (2.38 m² instead of 2.44 m²), but with 80 moulds/h it has achieved four times the cycle rate of others.

VHV supplied a variety of equipment for the project, including new sand bunkers, belt conveyors for used sand and finished sand, as well as scraper plows and dedusting connections. Among the elements supplied were 76 belt conveyors and a cover belt conveyor GB1000.

In addition, 4 polygon screens, a double molded sand

该项目包括开发和实施最先进的铸造系统，以满足市场对更大铸件的需求。团队会议中的密切协调和快速决策使项目过程得到了优化。Mehmet Atik 参加了会议，使改进建议得以及时的说明和实施。

技术细节和设备

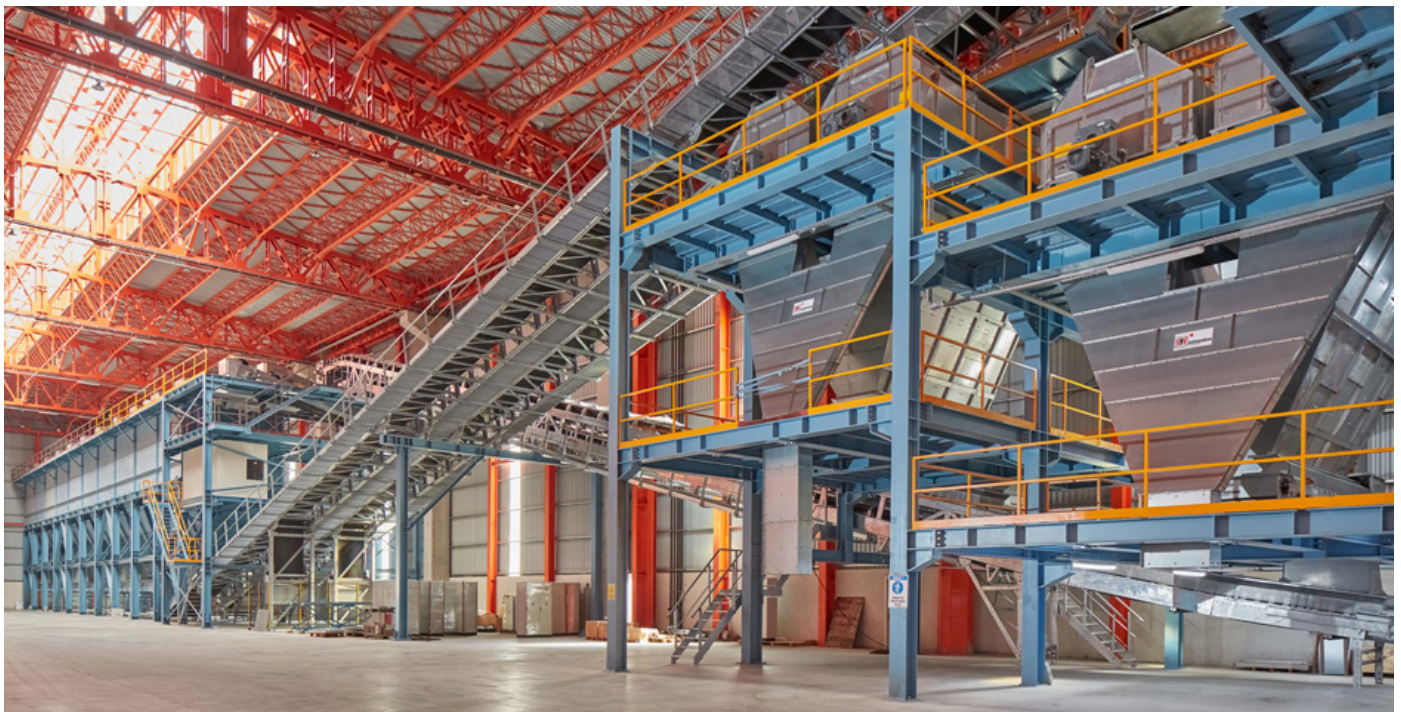
铸造厂的规模令人印象深刻，工厂厂房内长 350 米，宽 120 米，中心区有一个 24 米高的紧凑型工厂。该工厂配备了最先进的技术，包括 Evactherm® 系统中的 4 台 Eirich 搅拌机、HWS 5 和 HWS 6 造型线以及 4 台用于熔化铁水的电炉。

另一个重要方面是该项目的可持续性，因为很大一部分熔炼的材料是从报废的船舶中回收利用的。

ATIK METAL 使用 HWS6，虽然可能不是土耳其最大的造型箱（2.38 平方米，而不是 2.44 平方米），但其 80 个模具 / 小时的循环速度是其他产品的四倍。

VHV 公司为该项目提供了各种设备，包括新的砂仓、旧砂和成品砂的带式输送机，以及刮板和除尘连接，还包括 76 台带式输送机和一台 GB1000 型顶部带式输送机。

此外，VHV 公司还集成了 4 个多边形筛网、一个双模砂仓和一个新砂仓。最大吞吐率为 360t/h[300m³/h]。设备



bunker and a bunker for new sand were integrated from VHV production. The largest throughput rates are 360t/h [300m³/h]. The remarkable equipment features also include the partially reversible discharge belts. Another important aspect is the removal of the separated metals via compact belt conveyors in VHV K racks. The new foundry plant has a total output of 120,000 tons of castings per year.

Results and outlook

The successful cooperation of all companies involved has resulted in a project that meets the highest quality and performance standards. The new foundry plant will significantly increase ATIK METAL's production capacity and delivery range and consolidate its position as a leading supplier in the industry. VHV Anlagenbau GmbH would like to thank Mehmet Atik and his team for the trustful cooperation and this groundbreaking order.

Future developments

The successful realisation of the ATIK METAL foundry plant demonstrates the potential and possibilities of close cooperation between customers and suppliers. VHV Anlagenbau GmbH has shown here that they are also an absolutely reliable partner for large-scale projects and will continue to develop innovative solutions and supply customised systems to meet the constantly changing requirements of the industry. ■

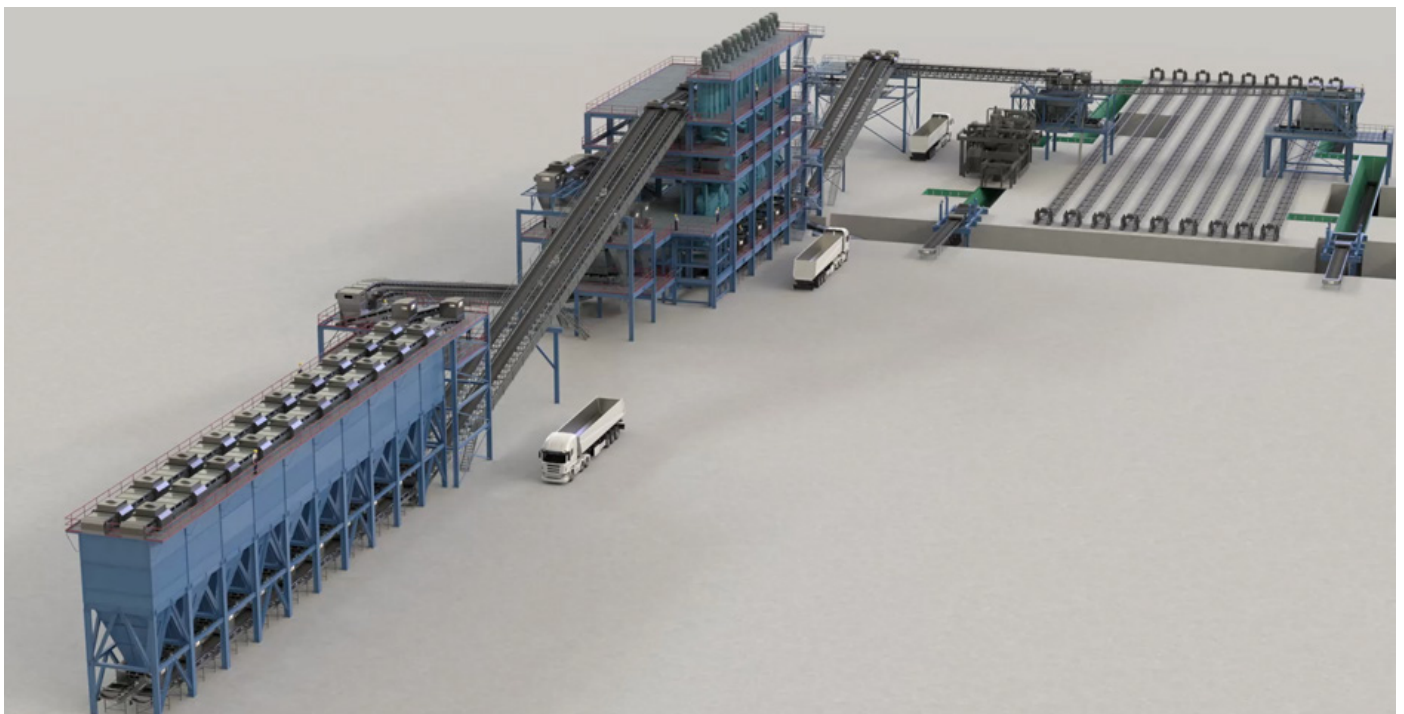
的显著特点还包括部分可逆方向的卸料带。另一个特点是通过 VHV K 的紧凑型带式输送机去除分离后的金属。新铸造厂每年可生产 12 万吨铸件。

成果与展望

所有相关公司的成功合作使项目达到了最高的质量和性能标准。新的铸造厂将显著提高 ATIK METAL 的生产能力和交付范围，巩固其作为行业领先供应商的地位。VHV Anlagenbau GmbH 公司感谢 Mehmet Atik 及其团队的信任及合作。

未来发展

ATIK METAL 铸造厂取得的成功展示了客户和供应商之间密切合作的潜力和可能性。VHV Anlagenbau GmbH 公司也证明，他们是大型项目绝对可靠的合作伙伴，并将继续开发和提供创新解决方案和定制方案，以满足行业不断变化的需求。■



Savelli'S International Activities In Mexico, Bosnia, Germany, Poland, Turkey And The UK

萨维利公司在墨西哥、波斯尼亚、德国、波兰、土耳其和英国开拓市场

The activities of the historical Italian company SAVELLI are highly successful and very flexible. The key to success lies in SAVELLI's ability to highly customize heavy duty and high performance complete systems. The company is internationally recognized, well networked and always wins interesting large projects.

As we recently learned, SAVELLI has already completed the manufacture of two horizontal F1 tight flask moulding lines equipped with the exclusive moulding process Formimpress (high pressure double squeezing model-side compaction) and the associated complete sand preparation and return systems for PMP Industries Bosnia (for hydraulic castings) and for MAT Foundry Mexico (for brake drums).

In addition, according to the positive order portfolio, SAVELLI is currently also manufacturing 1 large in-flask cooling house for Fritz Winter Germany (for large engine blocks and cylinder heads), 2 sand plants and 2 large rotary cooling drums ($\varnothing 4.200 \times 25.183$ mm) for Brembo Mexico and Poland (for brake discs), 1 sand plant for Odoksan Turkey (for municipal castings) and 1 tight flask moulding line with its sand plant for William Lee UK (for truck and automotive castings). Over the next 10 months, 300 trucks and containers will be delivered. ■

历史悠久的意大利公司萨维利取得了很大的成功，成功的关键在于萨维利公司能够非常灵活地定制完整的重型和高性能系统。公司获得国际同行认可，有广泛合作，参与了很多大型项目。

正如我们最近了解到的那样，萨维利公司已经完成了两条水平 F1 砂箱造型线的生产，这两条造型线配备了独特的造型工艺 Formimpress（高压双挤压模型侧压）以及为波斯尼亚 PMP 工业公司（液压铸件）和墨西哥 MAT 铸造公司（制动鼓）提供完整制砂和回砂系统。

此外，鉴于目前良好的订单情况，萨维利还为德国 Fritz Winter 公司制造 1 个大型砂箱内冷却室（用于大型发动机缸体和缸盖），为墨西哥布雷博和波兰布雷博公司（制动盘）提供 2 条砂型线和 2 个大型旋转冷却鼓（ $\varnothing 4.200 \times 25.183$ mm），为土耳其 Odoksan 公司提供 1 条砂型线（用于市政铸件），为英国 William Lee 公司（用于卡车和汽车铸件）提供 1 条砂型线。在接下来的 10 个月里，萨维利公司将交付 300 辆卡车和集装箱的订单。” ■



Winoa Unveils Its First Shot-Peening Site In India

Winoa 公司在印度成立第一个喷丸工厂



Winoa-2Effe Pvt Ltd, the joint-venture combining the two companies leading the way in shot-peening media and services, announces the opening of its first dedicated shot-peening facility in India. This brand-new infrastructure is strategically located in Pune, the heart of India's premier automotive manufacturing cluster.

After one year of construction, this new facility of 15,000 square foot has started operating with state-of-the-art technologies to deliver shot-peening meeting the highest standards for clients. Present in India for over 30 years, Winoa confirms its world leadership position by investing strongly, based on the trust of key clients and the growth of Indian market.

Key highlights:

Strategic location: Situated in Pune, India's leading automotive manufacturing hub, ensuring proximity and accessibility to major clients, suppliers and partners.

State-of-the-art technology: The facility is equipped with the latest shot-peening technologies meeting highest standards for automotive and aerospace components thanks to latest machines and laboratory. Fitted on 15,000 sq. ft shopfloor, the site also provides training solutions through a full range of technical courses to grow skills and performance.

Local employment: Winoa is committed to hiring local talent, creating new jobs in the Pune region. This initiative supports the local economy and provides opportunities for skill development within the community.

Commitment to excellence: Reflects Winoa's long-standing commitment to innovation, quality, and customer satisfaction. ■

Winoa-2Effe 私人有限公司是在喷丸和服务领域处于领先地位的合资企业，宣布在印度开设第一家专业喷丸公司。这座全新工厂的选址具有战略意义，位于印度首屈一指的汽车制造业产业集群中心浦那。

经过一年的建设，这座占地 15000 平方英尺的工厂采用最先进的技术，为客户提供符合最高标准的喷丸处理技术。Winoa 公司在印度已有 30 多年的历史，基于客户的信任和印度市场的增长，将通过加大投资，巩固其在全球市场的领先地位。

亮点：

战略位置：位于印度领先的汽车制造中心浦那，确保与主要客户、供应商和合作伙伴距离较近。

最先进的技术：得益于最新的设备和实验室，工厂配备了适合汽车和航空航天部件最高标准的最新喷丸技术。工厂占地 15000 平方英尺，还通过全方位的技术课程提供培训和解决方案，以提高工人的技能和绩效。

当地就业：Winoa 公司致力于雇佣当地人才，在浦那地区创造新的就业机会。该倡议支持当地经济，并为社区内的技能发展提供机会。

追求卓越：体现了 Winoas 公司对创新、质量和客户满意度的长期承诺。” ■

Waupaca Foundry Earns GM Award

沃帕卡铸造公司荣获通用汽车供应商奖

Waupaca Foundry Plant 4 ductile iron foundry in Marinette, Wisconsin was recognized with the 2023 General Motors Supplier Quality Excellence Award (SQEA).

“As we continue to navigate an ever-challenging environment, know that (Waupaca’s) dedication to quality and shared goals is deeply appreciated,” said Executive Director of GM Global Supplier Quality & Development Rick Demuynck. GM’s global supplier quality team recognized Waupaca Foundry for consistently providing support and being a valued partner.

The award is presented to top global suppliers who have met or exceeded stringent quality production and delivery standards and have demonstrated trust and transparency while working towards shared goals throughout the 2023 calendar year. Waupaca Foundry supplies various drivetrain components for multiple General Motors platforms across North America.

“On behalf of all our team members, we are proud to accept this award,” said Waupaca Foundry President, CEO, and COO Mike Nikolai. This is an outstanding recognition of Plant 4’s excellent quality performance for a challenging application.” ■

位于美国威斯康星州马里内特的沃帕卡铸造公司四厂（球墨铸铁生产厂）获得了 2023 年通用汽车供应商质量卓越奖（SQEA）。

通用汽车全球供应商质量与开发执行董事里克·德穆恩克表示：“随着不断应对充满挑战的外部环境，我们非常感谢沃帕卡公司对产品质量和共同目标做出的承诺。”通用汽车公司的全球供应商质量团队认可沃帕卡铸造公司始终如一地提供支持，并将其视为宝贵的合作伙伴。

该奖项颁发给那些在 2023 年满足或超过严格的质量生产和交付标准，并在实现共同目标的同时体现出信任和透明的全球顶级供应商。沃帕卡铸造公司为北美多个通用汽车平台提供各种动力传动系统部件。

沃帕卡铸造公司总裁、首席执行官兼首席运营官迈克·尼古拉表示：“我们很荣幸代表所有团队成员接受这一奖项，这是对公司四厂在具有挑战性的市场中表现出色的认可。” ■

Didion Rolls Out New, Modern Branding

Didion 公司推出新的现代化品牌

In preparation for celebrating its 50th anniversary in 2025, AFS Corporate Member DIDION unveiled the results of a major strategic rebranding in September.

Well-known among foundries for its durable, long-lasting shakeout, metal cleaning, and sand reclamation equipment, the company embarked on a year-long journey that included SWOT analysis, interviews with customers, and full market evaluation. Their new, modern website with fresh, engaging content is aimed at relating to the young generation of metalcasting professionals entering the industry. The site’s look and messaging are also being carried into advertisements, and all customer-facing communication. Even DIDION equipment is showcasing the new electric blue hue seen on the website.

为了迎接 2025 年公司成立 50 周年庆祝活动，美国铸造协会会员企业 DIDION 公司于 9 月公布了重大战略品牌重塑的结果。

DIDION 公司以其耐用、持久的振动筛，金属清洁和砂回收设备闻名于铸造业，并开始了为期一年的品牌重塑旅程，包括进行 SWOT 分析、客户访谈和全面的市场评估。新的、更现代的网站通过发布新鲜、引人入胜的内容，旨在与进入该行业的年轻一代铸造人建立联系。该网站的设计和 content 也具备广告和面向客户的沟通功能。甚至网站上 DIDION 公司的设备也显示出新的铁蓝色调。

“Our goal is to be more relatable to our foundry customers,” said President Mark Didion, who took the company’s helm in the spring of 2022. “During the process, we discovered how many companies tend to say the exact same thing about being the most innovative and having leading technology. We’re taking a different approach, because sometimes what we might want to say isn’t what the customer wants to hear—and if you’re not relating to them, you’re really just talking to yourself.

“Today, our website is more about telling our story,” he added. “It was hard work and a big investment, but I’m really proud that we didn’t take any shortcuts.”

Anonymous interview responses from foundry customers reflected favorable feedback about the company’s strong brand recognition and dependable, low-maintenance equipment, none of which will change, Didion added. “This is no joke—the No. 1 recommendation our customers had for us was, Don’t mess it up.”

Building on the revolving nature of its rotary machines, DIDION’s new tagline is “Built for revolution.” Didion said he’s focused on setting the company up for its next 50 years, during which he intends to keep the brand and marketing in sync with future generations of foundry management. ■

“我们的目标是与公司的铸造厂客户建立更紧密的联系，”于 2022 年春天掌舵的公司总裁 Mark Didion 说，“在这个过程中，我们发现有很多公司都愿意说自己是最具创新性和领先技术的公司。然而我们采取了不同的方法，因为有时我们想表达的并不是客户想听的——如果你与他们没有联系，你真的只是在自说自话。

“现在，我们的网站更多的是讲述我们的故事，”他补充说，“这是一项艰苦的工作和巨大的投资，但我真的很自豪我们没有走任何捷径。”

Didion 还表示，从铸造厂客户的匿名采访给予的积极反馈反映了对该公司强大的品牌认知度和可靠、低维护设备的认可，这些都不会改变。“这不是开玩笑——我们的客户对我们的首要建议是，不要搞砸了。”

基于其振动机器的旋转特性，DIDION 公司的新口号是“Built for revolution（为旋转而建）”。DIDION 表示，他专注于为公司未来 50 年的发展做好准备，使公司品牌和营销与未来发展保持同步。■

Rock Island Arsenal Achieves Its Largest Foundry Pour In Decades

岩岛兵工厂浇注出数十年来最大铸件

AFS Corporate Member The Rock Island Arsenal-Joint Manufacturing and Technology Center has set a new benchmark in its foundry operations: On June 6, the team successfully poured the largest part produced in at least two decades, if not ever—underscoring the facility’s advanced capabilities.

“This is a proud moment for all of us at RIA-JMTC,” said Jamie Morris, division chief of hot metals. “Producing such a massive part required precise coordination, advanced technology, and a relentless commitment to quality. This achievement is a testament to our team’s skill and dedication.”

The historic casting, a pintle system for a lock and dam in Pennsylvania for the Corps of Engineers, weighs 7,125 lbs. The mold for the casting comprised 16 distinct pieces, all of which were sand-printed at RIA-JMTC. This technique allowed for the precise creation of intricate mold components and enhances the accuracy of the final product. It also significantly reduces production time compared to traditional methods.

美国铸造协会会员企业岩岛兵工厂的联合制造和技术中心为铸造生产树立了新的标杆：6 月 6 日，该团队成功浇注了至少二十年来（如果曾经没有的话）的最大铸件，突显了该工厂的先进生产能力。

“对于岩岛兵工厂联合制造和技术中心（RIA-JMTC）的所有人来说，这是一个值得骄傲的时刻，”铁水部门主管杰米·莫里斯说，“生产如此巨大的零件需要精确的协调、先进的技术和对质量的不懈承诺。这一成就证明了我们团队的技能和奉献精神。”

这一历史性的铸件是宾夕法尼亚州工程兵团船闸和大坝的枢轴系统，重 7125 磅。铸件的模具由 16 个不同的部分组成，并且都是在 RIA-JMTC 通过砂型打印出来的。这项技术允许创建精确复杂的模具组件，并提高了最终产品

“The successful pouring of the pintle system showcases our capability to handle large-scale projects with precision,” said Shane Mattson, laboratory and process development and foundry production controller. “The integration of sand printing technology has revolutionized our approach, allowing us to meet and exceed the high standards required for such critical components.”

The team dedicated eight days to print all the components necessary for the mold. The resulting part exceeded the stringent specifications set by the Corps of Engineers.

“This project was a significant undertaking, and our team rose to the challenge admirably,” added Silas Gambleton Jr., RIA-JMTC foundry branch chief. “Their hard work and collaboration have paid off in a big way, and we couldn’t be more thrilled with the outcome.” ■

的精度。与传统工艺相比，它还大大缩短了生产时间。

实验室和工艺开发及铸造生产控制员谢恩·马特森表示：“枢轴系统的成功浇注展示了我们精确处理大型铸件项目的能力。砂型打印技术的整合彻底改变了我们的生产方法，使我们能够达到并超越这些关键部件所需的高标准。”

该团队用了 8 天时间打印模具所需的所有组件，由此生产出的铸件超过了美国陆军工程兵团的严格规定。

RIA-JMTC 铸造分公司负责人塞拉斯·甘博顿补充道：“这是一项重大任务，我们的团队出色地应对了挑战。他们的辛勤工作与合作取得了巨大的回报，我们对结果感到无比激动。” ■

OTTO JUNKER Marks 100 Years of Innovation

专注创新：奥托·容克公司成立 100 周年

AFS Corporate Member OTTO JUNKER GmbH, a pioneer in building equipment for foundries, is celebrating its 100-year anniversary.

Dr.-Ing. E.h. Otto Junker founded his metal processing company in 1924 in Lammersdorf, Germany, and built a close relationship with the Technical University of Aachen. Since Junker’s death in 1982, the company has been owned by the Otto Junker foundation, which supports the education of young engineers and promotes research projects at the university. The cooperation has led to numerous technological breakthroughs and has helped to maintain the technological leadership of the company.

“The capability to adapt to market requirements continuously and quickly—both from a technical and organizational point of view—remains an important success factor for us,” said CEO Erik Míček. “This is guaranteed by the technical competence and flexibility of our employees, which is what characterizes our company Our focus is not only on dealing with the challenges faced by our customers, but also on contributing to an environmentally-friendly industry in a proactive manner. The next 100 years will be characterized by our pursuit to continuously redefine the boundaries of what is technically possible.” ■

美国铸造协会会员企业奥托·容克是铸造设备领域的先驱，迎来了公司成立 100 周年。

E.h. 奥托·容克博士于 1924 年在德国拉默斯多夫创立了他的金属加工公司，并与亚琛工业大学建立了密切的关系。自 1982 年容克先生去世以来，该公司一直由奥托·容克基金会所有，该基金会为年轻工程师的教育和大学研究项目提供支持。合作带来了众多技术突破，并有助于保持公司的技术领先地位。

首席执行官埃里克·梅切克表示：“从技术和组织的角度来看，持续快速适应市场需求的能力仍然是我们取得成功的重要因素。这得益于我们员工的技术能力和灵活性，也是我们公司的特点……我们的重点不仅在于帮助客户应对挑战，还在于以积极的方式为环保行业做贡献。在未来的 100 年，公司仍将不懈追求，重新定义技术可能性的边界。” ■

General Kinematics Launches New Website for Gk Systems

General Kinematics 为 Gk Systems 推出新网站

EPC Firm GK SYSTEMS, a brand of AFS Corporate Member General Kinematics, unveiled its new website, gksystems.com.

GK Systems specializes in developing turnkey systems for foundries, recycling facilities, and aggregate processing plants. The GK Systems brand was officially launched in 2020 as General Kinematics systems division was growing rapidly.

“As our systems division has undergone rapid growth, we recognized the need to clearly define GK Systems’ story and offerings in the EPC market,” said CEO Thomas Musschoot. “This led us to create a dedicated website showcasing our systems division’s unique capabilities.”

Jim Egan, vice president of sales, added, “Our customers needed more options for turnkey solutions on their major projects. We knew we could provide an elite level of engineering and systems design that would provide them with the support they deserve.” ■

EPC 公司 GK SYSTEMS, 美国铸造协会会员企业 General Kinematics 旗下品牌, 推出了其新网站 gksystems.com。

GK Systems 专门为铸造厂、回收企业和骨料加工厂开发交钥匙系统。GK Systems 品牌于 2020 年正式推出, 得益于 General Kinematics 的系统部门发展迅速。

公司首席执行官托马斯·穆舒特表示: “随着我们的系统部门经历了快速增长, 我们认识到需要明确界定 GK systems 在 EPC 市场的故事和产品, 因此我们创建了一个专门的网站, 展示我们系统部门的独特能力。”

销售副总裁吉姆·伊根补充道: “我们的客户在其主要项目上需要拥有更多交钥匙解决方案的选择。我们知道我们可以提供精英级别的工程和系统设计, 为客户提供他们应有的支持。” ■

Ohio State Project Targets Cybersecurity For 3Dp In Metalcasting

俄亥俄州立大学项目致力于金属铸造 3D 打印技术的网络安全

The Ohio State University’s Center for Design and Manufacturing Excellence (CDME) is leading a project to improve the cybersecurity and operational efficiency of 3D-printed sand molds used in metal casting.

With collaboration from AFS Corporate Member Humtown Products and 3Degrees Company, CDME’s “Cybersecurity-Enhanced Efficiency in 3D Printed Sand Molds” project aims to implement an integrated solution to secure and optimize the manufacturing process.

The team received a 15-month, \$340,000 grant from the Department of Energy and the Cybersecurity Manufacturing Innovation Institute (CyManII), as part of a \$4.7 million initiative to enhance the cybersecurity landscape within American manufacturing.

The project will demonstrate how small and mid-size manufacturers can reduce costs through securely tracking manufacturing data via a cyber-physical passport. ■

俄亥俄州立大学设计与制造卓越中心 (CDME) 正在领导一个项目, 以提高金属铸造中使用 3D 砂型打印的网络安全和运营效率。

在美国铸造协会会员企业 Humtown Products 和 3Degrees 公司的合作下, CDME 的“增强 3D 砂型打印网络安全效率”项目旨在开发一个集成解决方案, 以保证和优化生产过程。

该团队获得了能源部和网络安全制造创新研究所 (CyManII) 为期 15 个月、34 万美元的资助, 这是 470 万美元计划的一部分, 旨在加强美国制造业的网络安全格局。

该项目将展示中小型生产企业如何通过网络物理渠道安全地跟踪生产数据, 从而实现降低成本。■

YIZUMI Expands into Mexico to Accelerate Global Growth

伊之密墨西哥子公司开业



On August 15th, local time, Yizumi Precision Machinery (Mexico) Co., Ltd. (YIZUMI Mexico) holds an open house to celebrate its official opening. This is another important milestone for YIZUMI's global strategy, following the establishment of YIZUMI Thailand in June of this year, and represents another solid step forward in its internationalization.

YIZUMI Mexico is a major gateway for YIZUMI in Latin America, helping to expand global markets, increase brand awareness, and provide high-quality after-sales support. Its technical service center is located in Queretaro, which has a superior geographical location and can provide more convenient and efficient after-sales support, technical support, and equipment delivery services throughout Mexico and Latin America.

Its main business includes the sale, display, and technical support of injection molding machines, die casting machines, rubber injection molding machines, and related spare parts. Currently, its technical service center employs several engineers and other support personnel. The center is more than 2,000 square meters in size and can accommodate dozens of different types of machinery. In addition, there is a spare parts warehouse stocked with thousands of spare parts to ensure equipment delivery and after-sales service. (Source: YIZUMI) ■

2024年8月15日，伊之密精密机械（墨西哥）有限责任公司举办了盛大的开业典礼暨开放日活动，这是继2024年6月伊之密泰国子公司开业后，伊之密在全球布局的又一重要里程碑，标志着其在国际化战略上再次迈出坚实的一步。

墨西哥子公司作为伊之密在拉丁美洲的重要桥头堡，对于公司开拓海外市场、提升品牌知名度以及提供优质的售后服务具有举足轻重的作用。该技术服务中心位于克雷塔罗，地理位置优越，将为墨西哥乃至整个拉丁美洲地区带来更加便捷、高效的售后支持、技术支持以及机器快速交付服务。

伊之密墨西哥子公司主要业务包括：注塑机、压铸机、橡胶机以及其零配件销售、产品展示和技术服务等。目前，伊之密墨西哥技术服务中心有工程师及其他支持人员若干名。服务中心面积超过2000平方米，可容纳各类机器数十台，此外还设有备件仓库，库存备件上千件，为机器交付和售后服务提供了坚实的保障。（信息来源：伊之密）。■

Building a New Pattern for High-quality Development of Foundry Industry Chain

——METAL CHINA, DIECASTING CHINA, NONFERROUS Exhibition Opens a New Chapter

构建铸造产业链高质量发展新格局

——2024 铸博会、压铸展、有色展华章新启



On July 4-7, 2024, with the anticipation and attention of the industry, with the theme of "Building a New Pattern for High-quality Development of Foundry Industry Chain", the "20th China International Foundry Expo" (METAL CHINA 2024), "17th China International Die Casting Industry Exhibition" (DIECASTING CHINA 2024), and "17th International Nonferrous and Special Casting Exhibition" was grandly held at the National Convention and Exhibition Center, Shanghai. With the aim to accelerate the development of new quality productivity, improve the traditional foundry industry, the event is positioned to stimulate momentum, inject new vitality, and create more opportunities

2024 年 7 月 4-7 日，在行业的热切期盼和瞩目中，以“构建铸造产业链高质量发展新格局”为主题的“第二十届中国国际铸造博览会”“第十七届中国国际压铸工业展览会”“第十七届国际有色及特种铸造展览会”在国家会展中心（上海）盛装亮相。乘着加快发展新质生产力的东风，为传统铸造业向“新”提“质”、实现跨越式发展汇聚万千力量、激荡澎湃动能、注入崭新活力、创造更多机遇！



for the whole foundry industry!

In the wave of booming development of new quality productivity, as an important platform for effective cooperation in the casting and upstream and downstream industrial chains, promoting domestic and foreign trade matchmaking, and leading industry innovation and upgrading, this exhibition covers both ferrous and nonferrous sectors, with an exhibition scale of 120,000 square meters. More than 1500 exhibitors from 26 countries and regions around the world gather in Shanghai to showcase industries such as automobiles, machine tools, and engineering machinery. The aim is to better promote and lead the high-quality development of the foundry industry, and build a convenient, efficient, and comprehensive platform for industry counterparts, commercial cooperation, academic exchanges, achievement transformation, and interactive networking.

After three years of the pandemic, this session of METAL CHINA and DIECASTING CHINA has once again focused the world's attention on China. The number and specifications of large-scale equipment in the equipment hall far exceed those in previous years, with a maximum equipment height of 13 meters; There are more presence of international pavilions, including Mexico, Poland, Germany, Italy, Japan, South Korea, Türkiye, etc., providing one-stop service for first-hand international information, programs and products.

在新质生产力蓬勃发展的浪潮中，作为畅通铸造及上下游产业链高效合作、力促海内外商贸对接、引领产业创新升级的重要平台，本届展会集结铸造展、压铸展、有色展同期举办，展出规模达 12 万平方米，来自全球 26 个国家和地区的 1500 余家参展商共聚沪上，辐射汽车、机床、工程机械等产业进行展示，旨在为更好推动和引领铸造行业高质量发展，构建起广受行业同仁充分信任的集商贸合作、学术交流、成果转化、互动联谊为一体的便捷、高效、综合性平台。

三年疫情后的这场真正意义上的国际铸造盛会，再次将世界铸造的目光高度聚焦中国。本届展会从生产实际出发进行了划馆、布展、分区，装备馆大型装备数量和规格远超往届，最大装备高达 13 米；墨西哥、波兰、德国、意大利、日本、韩国、土耳其等国际行业协会组成的国际展团带来的第一手国际化资讯、方案和产品，使展会一站式服务的作用发挥得更加明显。

4 天的展期内，展馆内人潮如织、展品熠熠生辉、商

During the 4-day exhibition period, the exhibition hall was filled with very positive atmosphere. There are 100,000 professional visitors from more than 40 countries and regions coming to the show, learning new technologies, exchanging ideas and meeting friends. From high-precision and cutting-edge castings to intelligent equipment, from green and environmentally materials to integrated casting processes, 12 characteristic pavilions and 7 local clusters including Jiahe, Qingyang, Huixian, Botou, Liyang, Xiangshan, and Ningguo, showcased latest castings, technologies, semi-solid process supply chain, extrusion technology, low-pressure technology, advanced materials, high-end equipment, environmental protection equipment, etc.. More than 100 concurrent events, including new product releases, forums, technical lectures, focusing on hot topics are staged.

Trade buyers and visitor delegations from all over the world flock here to seize business opportunities, secure orders, expand cooperation, and build connections. There are large and diverse procurement demands, with sparks of cooperation and countless wonderful moments.

We would like to express our gratitude once again to all the leaders, guests, exhibitors, and visitors who have participated in the METAL CHINA 2024 and DIECASTING CHINA 2024 from all over the world. Many thanks for your understanding, support and kindness. Looking forward to meeting you in the next session, METAL CHINA 2025 and DIECASTING CHINA 2025, from May 20-23, 2025, National Convention and Exhibition Center (Tianjin).

For more information, please visit: www.expochina.cn or send email to: limengmeng@foundry.com.cn ■

贸洽谈氛围浓厚、商机涌动，来自 40 多个国家和地区的超 10 万人次专业观众不断向展会集结，参观、交流、洽谈。从高精尖铸件到智能化设备，从绿色环保新材料到一体化等铸造新工艺，以大交通铸件、精密铸造技术、压铸智能化、半固态工艺供应链、挤压工艺、低压工艺、先进材料、高端装备、环保设备等为代表的 12 个特色展区和嘉禾、青阳、辉县、泊头、溧阳、象山、宁国等 7 个特色产业集群在这里尽情展示，聚焦热点的新品发布、高峰论坛、技术讲座、趋势引领轮番上演，同期百余项新品发布、签约合作、论坛研讨等重磅活动缤纷呈现。

来自全球各地的专业采购商、观展团纷纷至沓来，捕捉商机、锁定订单、延伸合作、精准对接，大体量、多样化的采购需求持续释放，频频碰撞出合作火花，创造出无数精彩瞬间。

在此，再次感谢各位领导、嘉宾以及从世界各地聚集而来的展商和观众，是你们的理解、支持与厚爱使展会进行的如此顺利成功。我们期待着与您相聚下一届展会，2025 年 5 月 20-23 日，国家会展中心（天津）。

更多展会信息，请登录展会网站 www.expochina.cn。 ■





The future of foundry, modern machines and innovative technological solutions - the Targi Kielce Industrial Autumn's Highlights

未来铸造、现代设备和创新技术解决方案—— 凯尔采秋季工业展的亮点

The two-day Metal Expo witnessed the foundry industry representatives discussing the latest solutions and the future of heavy industry. Over 200 companies from 22 countries presented cutting-edge technologies and machines for the foundry industry. Ecology and Polish sector transformation were among the Targi Kielce Industrial Autumn's highlights.

The future of the industry - business talks and meetings at the Targi Kielce Industrial Autumn

为期两天的波兰金属展览会见证了铸造行业的代表讨论最新的解决方案和重工业的未来。来自 22 个国家的 200 多家展商展示了铸造行业的尖端技术和设备。生态环保和波兰行业转型是凯尔采秋季工业展的亮点。

在凯尔采秋季工业展举办的商务洽谈和会议探讨行业的未来

The METAL Expo and its accompanying trade shows: Heat Treatment, Aluminium & Nonfermet, Control-Tech and Recycling have attracted the most prominent companies from the foundry and heavy industry to Kielce for years. This year, Targi Kielce hosted over 200 companies, including such brands as: DISA, Magaldi, Agrati, Frech Polska, Metals Minerals, Motul Baraldi, Kanthal, Mead Formi, RTD Group, Gunther Polska, Inductotherm Europe, Pyrotek, Heraeus, MTR IZO, Enimetal, Metals Minerals, TPE Engineering. These exhibitors' presence proves the event's importance; Targi Kielce show is ranked third largest convention of this type in Europe, after the largest GIFA Expo organised in Dusseldorf and Euroguss in Nuremberg. – Accessibility, professionalism and modernity are the three words I associate with the Metal Expo. Our presence in Kielce allows us to reach 40-50 large clients in Poland during the two-day show, something that would typically take us half a year or a year. This shows that the event still has a future – Przemysław Czapla, President of Eurocast Industries, said during the Expo. Thomas Fritsch, CEO of Foundry Planet, was also happy to be present in Kielce; he also emphasised the 20-year cooperation, recalling his beginnings and first visits to Targi Kielce. – The Metal Expo is ideal for industry representatives from this part of Europe. METAL is an essential place on the map of Europe in the context of this industry. The media I represent always try to be where the companies, the best products and industry experts mark their presence. Hence our presence at Targi Kielce – added Thomas Fritsch.

Energy transformation marks the future of foundry business

The Foundry Goes Green seminar was again held within the scope of the Expo; the consecutive Seminar unveiling was devoted to ecology and energy saving in a broadly defined modern foundry. Industry 4.0 and clean air technologies, as well as the cutting-edge heat treatment of metals, are in abundance at the congress. Foundry is an energy-intensive industry with high CO2 emissions; therefore, high energy prices and penalties for environmental pollution force this sector to change. The search for new technologies and, of course, savings is a must. – Poland's electricity prices are some of the highest in Europe. In June 2024, 810 kg of CO2 was emitted to generate 1 MWh of energy in Poland. For comparison, in Germany - 310 kg, France - only 20 kg – Andrzej Ładysz and Adrian Jonczyk from ABAS Business Solutions Poland said during the Foundry Goes Green seminar. The presenters explained the key aspects of iron foundries' carbon footprint: high process emissions, energy-intensive input materials, electricity and heat, and regulations and initiatives.

Foundry crisis

The foundry industry has been struggling with numerous challenges in recent years, which can be referred to as a crisis. The challenging situations stems from the rising costs of energy, raw materials and the pressure related to ecological transformation, to name a few. The requirements for CO2 emissions reduction and growing expectations for sustainable production are putting additional strain on foundries. These problems are particularly acute in Europe, where production costs are higher than in other regions, and as a result, some companies are closing down or moving production to cheaper countries. – Founders are tough people and they will undoubtedly

多年来，凯尔采金属展览会及其配套展：热处理、铝和有色金属、控制技术和循环利用专题，吸引了200多家铸造和重工业领域的知名企业参展，包括DISA、Magaldi、Agrati、Frech Polska、Metals Minerals、Motul Baraldi、Kanthal、Mead Formi、RTD Group、Gunther Polska、Inductotherm Europe、Pyrotek、Heraeus、MTR IZO、Enimetal、Metals Minerals、TPE Engineering等企业，他们的参展证明了此次展会的重要性。凯尔采展会在欧洲同类展会中排名第三，仅次于在杜塞尔多夫举办的国际铸造展GIFA和在纽伦堡举办的压铸展EUROGUSS。——获得性、专业性和现代性是我与凯尔采金属展联系在一起的三个词。参加凯尔采展会使我们能够在为期两天的展会期间接触到波兰的40-50家大企业，若不是参加展会，则需要我们半年或一年的时间去接触他们，这表明展会仍有未来——Eurocast Industries公司总裁Przemysław Czaplas表示。Foundry Planet首席执行官Thomas Fritsch先生很高兴来到凯尔采铸造展，并强调了20年来的合作，回忆了自己最早参加凯尔采展会的情况，他表示：凯尔采铸造展是该地区最重要的展会之一，在欧洲地区占有重要位置。作为媒体代表，我们会参加铸造企业、最新的产品和行业专家聚集的相关活动。因此，我们来到了凯尔采展会。

能源转型预示铸造业的未来

“绿色铸造研讨会”再次在展会期间举办，研讨会致力于交流现代铸造厂的节能和环保。工业4.0和清洁空气技术、以及先进热处理技术均在展会上展示。铸造是一个二氧化碳排放量高的能源密集型行业，因此，高昂的能源价格和环保要求迫使铸造行业做出改变。开发新技术的同时，节约成本是必须的。波兰ABAS Business Solutions公司的Andrzej Ładysz和Adrian Jonczyk在“绿色铸造研讨会”上说：波兰的电价在欧洲属于较高的行列。2024年6月，在波兰产生1兆瓦时的能源，需排放810kg二氧化碳。相比之下，德国排放量为310kg，法国仅为20kg。演讲嘉宾们解释了影响铸铁厂碳足迹的关键因素：高排放、能源密集型的要素投入、电力和热力，以及相关的法规和措施。

Foundry crisis 铸造行业面临的危机

近年来，铸造行业一直在努力应对诸多挑战，可以说是一场危机。挑战源于包括能源、原材料价格的上涨以及环保转型相关的压力等。减少二氧化碳排放的要求和

cope even in times of crisis affecting the foundry industry – Ryszard Kielczyk, member of the Board of the Technical Association of Polish Foundrymen at the opening of the Industrial Autumn in Targi Kielce.

New technologies in the non-destructive testing sector

Industrial Measurement Technology and Non-Destructive Testing (NDT) play critical roles in the quality and safety of production processes. Advanced technologies such as ultrasound, radiography, thermography and eddy currents, make it possible to detect material and structural defects without damaging the tested objects. NDT is widely used in automotive, aviation, energy and construction industries, enabling precise inspection of components, which translates into longer life and greater safety of structures and products. Control-Tech is Poland's most important event presenting the latest measuring instruments and machines. The wide and diversified range of producers was complemented by industry seminars and lectures that featured top specialists. The two-day Expo showcased the latest technologies in specialised measurements, analytical equipment, materials testing, measuring instruments and components for measuring and testing. ■

对可持续生产的日益增长的期望给铸造厂带来了额外的压力。这些问题在欧洲尤为突出，因为欧洲的生产成本高于其他地区，一些企业正在关闭或将生产转移到成本更低的国家。波兰铸造技术协会董事会成员 Ryszard Kielczyk 出席了展会开幕式并表示：铸造企业是具有韧性的，即使铸造业当前面临着危机，他们无疑也能够应对挑战。

无损检测领域的新技术

工业测量技术和无损检测（NDT）对保证生产过程的质量和安全性起着至关重要的作用。超声波、射线照相、热成像和涡流等先进技术可以在不损坏被测物体的情况下检测材料和结构缺陷。无损检测广泛应用于汽车、航空、能源和建筑行业，能够对部件进行精确检测，从而延长结构和产品的寿命，提高安全性。Control Tech 控制技术展是本届展会最重要的主题之一，展示了最新的测量仪器和设备。不仅有各领域的展商，还举办了行业研讨会和顶尖专家讲座。为期两天的展会展示了专业测量、分析仪器、材料检测、测量仪器和测量测试组件等领域的最新技术。■



A prospect of the Asia Foundry Industry from Asia Foundry Forum

从亚洲铸造论坛看亚洲铸造行业发展

China Foundry Association
中国铸造协会

On September 19, 2024, the 6th Asia Foundry Forum was held at the Bangkok International Trade Exhibition Center in Thailand. At the forum, Japan Foundry Society, the Institute of Indian Foundrymen, Taiwan Casting Industry Association, Indonesian Foundry Industries Association, and China Foundry Association shared information on the current situation and changes occurred in recent years from different perspectives. We attempted to find the distinctiveness inside and make prospects of the development of the Asia foundry industry from different dimensions.

1. What is the current situation of the Asian foundry industry?

In Japan, the output value of the foundry industry has remained at around 2 trillion yen in recent years, with ferrous metal casting and non-ferrous metal casting each accounting for half. Compared to 2022 and 2023, Japan's foundry industry has recovered in some degree; Taking the automotive industry as an example, the amount of cast iron parts used in automobiles increased from 1.93 million tons to 2.01 million tons, and the amount of aluminum alloy castings increased from 890,000t to 960,000t. In 2023, India's casting production reached 14.16 million tons; The casting output in Taiwan province of China reached 660,000t; Indonesia's casting production reached 740,000t; China mainland's casting production reached 51.9 million tons. The Asian foundry industry holds an important position in the world.

In terms of the number of foundry enterprises, there is a decrease in Japan, from 1758 in 2015 to 1659 in 2020. Among the 100 decrease, the number of ferrous casting companies accounts for 80%; In India, there are approximately 5000 foundry companies; In Taiwan province of China, there are about 800 foundries; In Indonesia, there are approximately 45 foundries; The number of foundries in China Mainland is about 23,000.

2. What are the characteristics of the Asian foundry industry among different countries/regions?

2024 年 9 月 19 日，在泰国曼谷国际贸易展览中心召开了第六届亚洲铸造论坛。论坛上，日本铸造协会、印度铸造业者协会、台湾铸造品工业同业公会、印度尼西亚铸造协会和中国铸造协会分别从不同的侧面分享了铸造业近年来发生的变化，我们对报告内容进行梳理，通过自问自答的方式，尝试从不同的维度观察亚洲铸造业的发展情况。

1. 亚洲铸造业现状如何？

在日本，近年来铸造业的产值维持在 20,000 亿日元左右，其中黑色金属铸造和有色金属铸造各占一半，相较于 2022 年、2023 年，日本的铸造业有所恢复；以汽车行业为例，应用于汽车的铸铁件从 193 万吨增加到 201 万吨，铝合金铸件从 89 万吨增加到 96 万吨。2023 年，印度铸件产量达到 1416 万吨；中国台湾地区的铸件产量达到 66 万吨；印度尼西亚的铸件产量达到 74 万吨；中国的铸件产量达到 5190 万吨。亚洲铸造业在全世界占据重要的地位。

在日本，铸造企业的数量进一步减少，企业数量由 2015 年的 1758 家减少到 2020 年的 1659 家，数量减少近百家，其中黑色金属铸造的企业减少占据了 80%；在印度，铸造企业数量约为 5000 家；在中国台湾地区，铸造企业数量约为 800 家；在印度尼西亚，铸造企业约为 45 家；中国的铸造企业数量约为 2.3 万家。

2. 亚洲铸造业在不同国家 / 地区之间发展特征如何？

由于下游行业的需求变化，不同国家 / 地区的铸造业

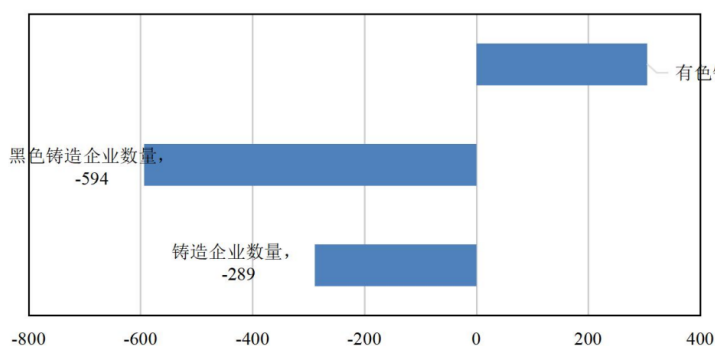


Figure 1: Changes in the number of Chinese foundry enterprises
图 1 中国铸造企业数量的变化情况

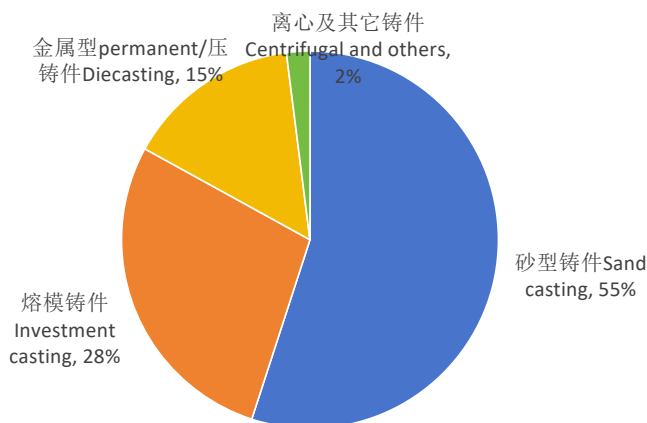


Figure 2: Proportion of output of different casting processes in Taiwan, China
图 2 中国台湾地区不同铸造工艺的产量占比

Due to changes in downstream industry demand, the foundry industry in different countries/regions has also undergone structural changes. For example, in China, according to incomplete statistics, the number of foundries decreased by nearly 289 between 2020 and 2023, with 594 enterprises decrease in ferrous casting and 305 increase of non-ferrous casting enterprises (see Figure 1). The same is true of Japan, from an annual growth rate of 4.1% for cast iron parts to 7.5% increase rate for aluminum castings between 2022 and 2023. The lightweighting of automobiles and the transition from internal combustion engine vehicles to hybrid or electric vehicles are the main driving factors, although electric vehicles in Japan are not as popular as that in China.

The regional characteristics of different countries are also quite obvious. In India, the corresponding characteristics between the foundry industry clusters and downstream industries are very obvious. For example, the Coimbatore cluster is famous for its pump set castings, while Golhapur and Belgaum produce automotive castings, and Rajkot produces diesel engine castings. In Taiwan, China, the output per square meter of foundry enterprises can reach 40.2 tons, which is said to be the first in the world; Investment casting plays an important role in Taiwan, ranking second among different casting processes (see Figure 2).

也发生了结构性的变化。例如在中国，据不完全统计，在 2020 ~ 2023 年间，铸造企业数量减少了近 289 家，其中黑色铸造企业减少了 594 家，而有色铸造企业则增多了 305 家（见图 1）。在日本也发生了同样的趋势，2022 年至 2023 年间，从铸铁件年增长率 4.1%，转向铝铸件年增长率则达到了 7.5%。汽车轻量化以及从内燃机汽车向混合动力汽车或电动汽车的转变是其中的主要因素，尽管日本的电动汽车并不像国内这样如火如荼。

不同国家的地域化特征也比较明显。在印度，铸造产业集群和下游行业的对应特征非常明显，例如哥印拜陀集群以泵组铸件而闻名，戈尔哈布尔和贝尔高姆生产汽车铸件，拉杰科特生产柴油发动机铸件等。在中国台湾地区，铸造企业单位平米的产量可达到 40.2 吨，据称可达到世界第一位；熔模铸造在台湾地区占据着重要地位，在不同的铸造工艺中，熔模铸造可排到第二位（见图 2）。

在铸造的下游行业方面，尽管占比不同，汽车行业成

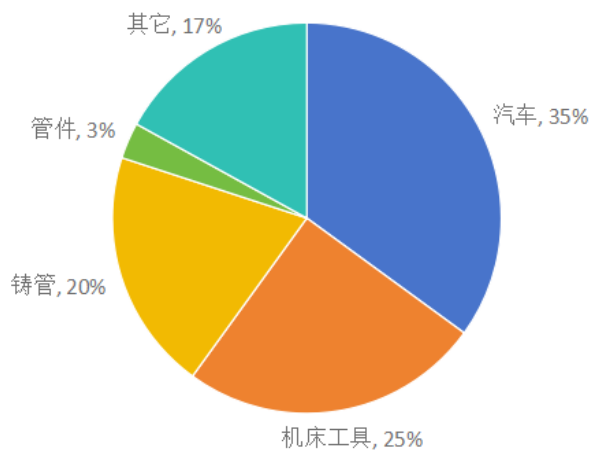


Figure 3: Casting demand distribution of downstream industry in Taiwan, China
图 3 中国台湾地区铸造下游行业需求分布

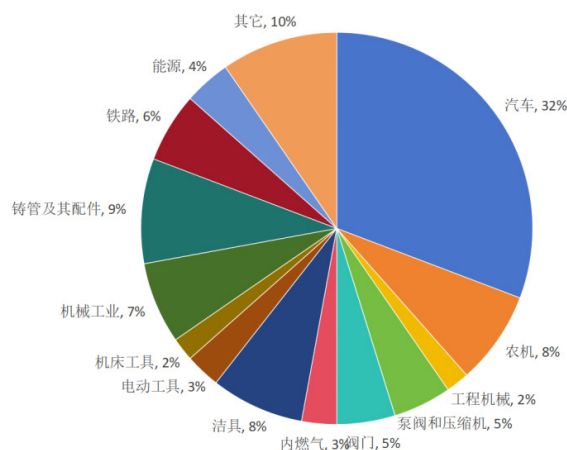


Figure 4: Casting demand distribution of downstream industry in India
图 4 印度铸造下游行业需求分布

3. Will the Asian foundry industry have a better future?

In India, the latest manufacturing policy plans to increase the share of manufacturing in GDP from the current 15% to 25%. Due to the crucial role of the foundry industry in supporting manufacturing: almost all machinery and other manufacturing industries rely on the foundry industry, India's casting production is expected to increase by 7% -10% by 2024. On the contrary, a survey by the Japan Foundry Society shows that over 70% of respondents predict that the foundry industry will remain unchanged or become worse in 2024. In Taiwan, China, the increase of semiconductor equipment and renewable energy will become the main driving force for the growth of Taiwan's foundry industry.

However, different countries and regions will also face the same questions, such as rising labor prices, carbon policies, environmental protection, and other factors that bring pressure to the foundry industry. Automation, intelligence, and new technologies (such as 3D printing and robots) have become indispensable driving forces for the sustainable development of the foundry industry. In any case, in order to ensure its sustainable development, the cultivation of industry talents is extremely important, and this is true to different countries in Asia.

Overall, the Asian foundry industry plays a pivotal role in the global foundry industry, both in terms of casting output and categories; Due to differences in natural endowments, different countries/regions in Asia exhibit distinct characteristics; Although different countries/regions have different views on the growth of the foundry industry due to different stages of development, the factors that affect the foundry industry tend to be the same. With the equipment improvement, the demand for industry talents are growing and becoming increasingly important.

Note: The data in the article were published in the reports made by the Japan Foundry Society, the Institute of Indian Foundrymen, Taiwan Casting Industry Association, Indonesian Foundry Industries Association, and China Foundry Association at the 6th Asia Foundry Forum. The copyright belongs to the aforementioned associations.. ■

为每个国家 / 地区需求最重要的下游行业。同时，不同的国家 / 地区也各不相同。在中国台湾，除了汽车行业，机床工具和铸管是最主要的需求下游行业（见图 3）。而在印度，下游行业的需求则更加多元（见图 4）。当然，需要说明的是，上述差别不排除各个国家的统计不同带来的影响。

3. 亚洲铸造业未来会更好吗？

在印度，最新的制造业政策计划将制造业在 GDP 中的份额从目前的 15% 增加到 25%，由于铸造行业对制造业的支持作用非常重要：几乎所有的机械行业及其它制造中都离不开铸造业的发展，因此印度铸件产量预计在 2024 年将增加 7%–10%。与此相反，日本铸造协会的调查显示，超过 70% 的被调查者预测 2024 年铸造行业将维持不变或变得更差。在中国台湾地区，由于半导体设备、可再生能源带来的增加将成为台湾地区铸造业增长的主要动力。

除了以上因素，不同国家地区之间也将面临同样的问题，如劳动力价格上涨、双碳政策、环境保护等因素都给铸造行业的发展带来压力，自动化、智能化、新技术（如 3D 打印和机器人）已经成为铸造行业可持续发展的不可或缺动力。无论如何，为了保障铸造行业的可持续发展，行业人才的培养极其重要，亚洲不同国家之间都是如此。

总体来看，亚洲铸造业在全世界的铸造业中占据着举足轻重的作用，无论是在铸件产量和铸件品类上；在亚洲的不同国家 / 地区，由于自然禀赋的不同，各个国家呈现了不同的鲜明特征；尽管因为发展阶段不同，不同国家 / 地区对铸造行业增长与否看法不同，但影响铸造行业的因素却趋于相同，随着装备水平的提高，对于行业人才的要求越来越高，也正在变得越来越重要。

说明：文中数据来自日本铸造协会、印度铸造业者协会、台湾铸造品工业同业公会、印度尼西亚铸造协会和中国铸造协会在第六届亚洲铸造论坛所做的报告，版权归上述协会所有。■

The 10th BRICS Foundry Forum Held in Yekaterinburg

第十届金砖国家铸造业高层论坛在 叶卡捷琳堡举行



On November 12, 2024, the 10th BRICS Foundry Forum was held in Yekaterinburg, Russia. The heads of the foundry industry organizations from BRICS countries, as well as a number of important guests, gathered together to exchange and discuss the situation and development trends in the foundry industry of BRICS countries and other issues.

Since its establishment in September 2010, the "BRICS Foundry Forum" has provided a more stable, convenient, efficient and pragmatic platform for exchanges and interactions among the BRICS foundry. Although the outbreak of the global pandemic has temporarily blocked opportunities for face-to-face communication and exchange, it cannot hinder the confidence and action of members to interact, share information, and work together to promote the development of the global foundry industry. The exchange and cooperation among BRICS countries' foundry organizations have a long history and rich connotations, and the multi-dimensional and all-round interaction mechanism is also continuously consolidating.

The 10th BRICS Foundry Forum is of great significance in consolidating consensus and drawing a vision together. Consul Ms.

2024年11月12日，第十届金砖国家铸造业高层论坛在俄罗斯叶卡捷琳堡召开。来自金砖各国的铸造行业组织负责人，以及相当数量的重量级嘉宾共聚一堂，围绕金砖各国铸造业的近期动态、新加入金砖国家的入会事宜等内容开展交流研讨。

始于2010年9月的“金砖国家铸造业高层论坛”自成立以来，为金砖国家铸造业间的交流与互动提供着更加稳定便捷且高效务实的平台。虽然全球疫情的爆发暂时阻断了面对面沟通、交流的机会，但阻隔不了成员间互动交流、信息共享、携手推动全球铸造业发展的信心和行动。金砖国家铸造组织间的交流与合作由来已久、内涵丰富，多维度、全领域的互动机制也在持续巩固。

第十届金砖国家铸造业高层论坛对凝聚奋进共识、同绘美好愿景具有重要意义。驻叶卡捷琳堡领事赵俊芳在论坛致辞中回顾了中俄重型机械合作的历史与成就，强调中

Zhao Junfang, stationed in Yekaterinburg, reviewed the history and achievements of China-Russia heavy machinery cooperation in her speech at the forum, emphasizing the unique advantages and vast development space of bilateral cooperation between China and Russia in foundry. She hopes that under the guidance of the "Great BRICS" spirit, cooperation in the foundry industry of BRICS countries will surely open a new chapter.

In the speech at the forum, Mr. Zhang Libo, President of China Foundry Association, stated that currently, the total casting production of BRICS countries has reached about 65% of the global casting production, and there is huge room for cooperation in the foundry industry among BRICS countries. He hopes that all parties attending the forum can take the opportunity to deepen cooperation, explore the creation of a global supply chain for the foundry industry, accelerate digital transformation, promote green and low-carbon development, and formulate international standards that benefit enterprises to reach new consensus.

During the main reports, I.A. Dibrov, Honorary President of the Russian Association of Foundrymen (RAF), made a report on the State of foundry production in Russia and prospects for its development; A.A. Fillipenko, President of the Union of Small and Medium Businesses of the Sverdlovsk Region, made a report on Foundry production in the Sverdlovsk region; E.V. Panfilov, PJSC KAMAZ, made a presentation on the Foundry Yesterday, today and tomorrow; V.D. Belov, Head of Faculty at the Moscow Institute of Steel and Alloys, discussed on the training of foundry specialists in view of the current conditions of Russia's industrial development; Thomas Gao, Executive Vice President of China Foundry Association, made his report on the present and future of China's foundry industry; D.S.Chandrasekar, Standing President IIF introduced the foundries development in India online; Nigel Pardoe, President SAIF talked about the Foundry production in South Africa online; Adele Nafal from Egypt, make a report on the role of Research and Technology Organizations (RTOs) in the development of the foundry industry. There were also another 2 sub-sessions, including the Production of high quality ferrous alloy castings and non-ferrous alloys, foundry molds and cores made of sand and clay combined with chemical hardening mixtures, model-technology tooling, specialty casting technologies, and additive technologies in foundry production.

In June 2009, the first meeting of BRICS leaders was held in Yekaterinburg. Today, 15 years later, the 10th BRICS Foundry Forum is being held here, which will surely gather the powerful force of common development among BRICS countries. With deeper partnerships and practical cooperation, the BRICS foundry will jointly compose the main development theme and promote the entire industry to move towards a more prosperous and beautiful future.

At the end of the forum, the baton of the rotating presidency of the BRICS Foundry Forum was officially handed over to China Foundry Association. Taking over the baton from its predecessor, China Foundry Association is willing to work with all BRICS partners to continue upholding the BRICS concept of openness, integration, and mutual benefit, and to build new bridges and open up new prospects for promoting economic and trade cooperation among BRICS countries' foundry industries. ■

俄铸造双边合作所具有的独特优势和广阔的发展空间，她希望在“大金砖”精神的引领下，金砖国家铸造业的合作必将开启全新篇章。

中国铸造协会会长张立波在论坛致辞中表示，目前，金砖国家的铸件总产量已达全球铸件总产量的约 65%，各国间铸造业合作空间巨大，希望与会各方借本次论坛契机，在深化合作，探讨打造铸造行业全球供应链，加快数字化转型，推动绿色低碳发展，制定惠及企业的国际标准等方面达成新的共识。

在主论坛报告环节中，俄罗斯铸造协会名誉主席 I.A. Dibrov 作了《俄罗斯铸造生产现状及其发展前景》报告，斯维尔德洛夫斯克地区中小企业联盟主席 A.Fillipenko 作了《斯维尔德洛夫斯克地区的铸造生产》报告，PJSC KAMAZ 公司 E.V.Panfilov 作了《KAMAZ PJSC 铸造业的昨天、今天和明天》报告，莫斯科钢铁与合金学院院长 V.D.Belov 作了《基于俄罗斯工业发展现状下的铸造专业教育及培训》报告，Adele Nafal 作了《研究和技术组织（RTOs）在铸造行业发展中的作用——来自埃及的案例分析》报告，中国铸造协会执行副会长高巍作了《中国铸造行业现状及发展趋势》报告，印度铸造协会常务会长 D.S.Chandrasekar 作了《印度铸造业概况》报告，南非铸造协会会长 Nigel Pardoe 作了《南非铸造业概况》，埃及冶金研究所教授阿黛尔·纳夫尔作了《研究和技术组织在铸造业发展中的作用——来自埃及的案例分析》报告。此外，以“高质量铁合金铸件的生产”与“高质量有色合金铸件的生产”为主题的两场分论坛分别展开，行业趋势、市场需求、绿色低碳、最新产业思想、前沿技术与产业链供应链等行业热点问题从论坛交流分享中被挖掘、放大、重视，一幅金砖国家铸造业携手并进的美好画卷正在不断绵延铺展，在行稳致远的金砖合作机制下愈显耀眼。

2009 年 6 月，金砖国家领导人首次会晤正是在叶卡捷琳堡市举行，15 年后的今天，第十届金砖国家铸造业高层论坛在此举办，这必将汇聚起金砖各国共同发展的强大力量，以更加深入的伙伴关系和更加深入的务实合作，共同谱写铸造业发展的主旋律，推动整个行业迈向更加繁荣美好的明天。

论坛最后，金砖国家铸造业高层论坛轮值主席国的接力棒正式交到中国铸造协会手中。接过前任的接力棒，中国铸造协会愿同所有金砖伙伴一道，继续秉持开放、融合、互利共赢的金砖理念，为推动金砖国家铸造行业间的经贸合作搭建新的桥梁、打开新的局面！ ■

第二十一届中国铸造协会年会

The 21st Annual Congress of China Foundry Association

2025年5月17-20日 中国·天津

May 17-20, 2025 Tianjin, China



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New And Intelligent Brake Disc Grinding Equipment

新型、智能刹车盘研磨设备

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Equipment profile:

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

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5. Single cycle time: 8-10s/pc

6. Equipment size: 4642x1978x2304mm

7. Equipment weight: 3600 KG

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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 $\varnothing 200\text{mm}$ - $\varnothing 420\text{mm}$ 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% 砂轮损耗成本。

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。

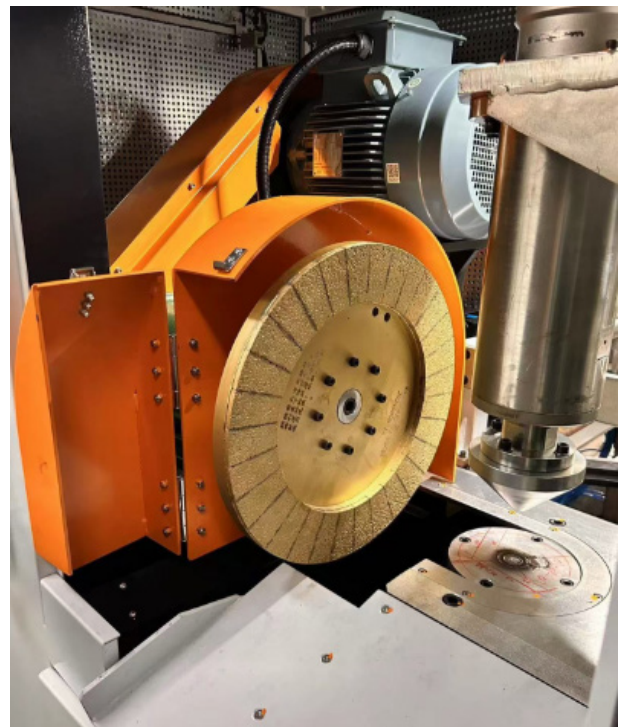
5. 单循环时间：8-10s/ 个。

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。

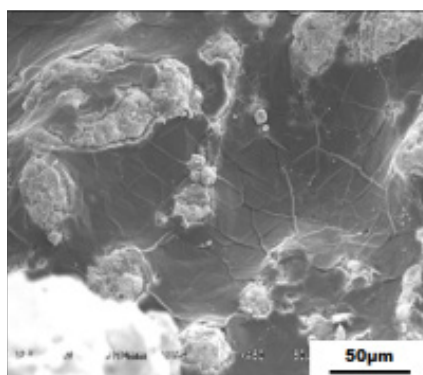
为防止铸件产生氮气孔缺陷，常见的工艺措施有：严格控制原材料品质，采用氮含量低的废钢、石墨化增碳剂和低氮树脂；减少砂芯发气量，加强砂芯排气，确保砂芯排气通畅；在氮气孔缺陷部位增加溢流冒口等，通常将以上措施简称为“减、排、溢”，并在改善过程中取得了良好的效果。

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：

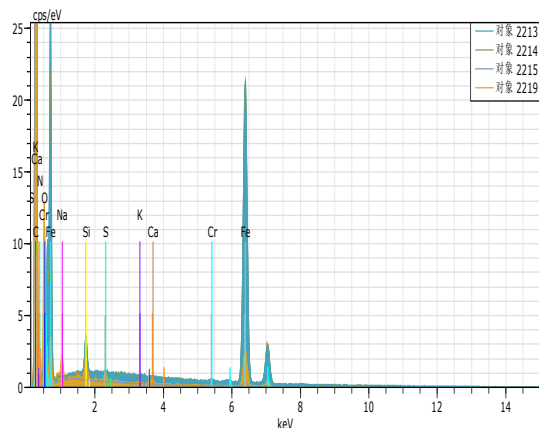
1. 片状石墨长度变短，宽度稍有增加，弯曲长度增加，石墨端部钝化；
2. 基体组织中珠光体数量增多，粗片状珠光体比例减



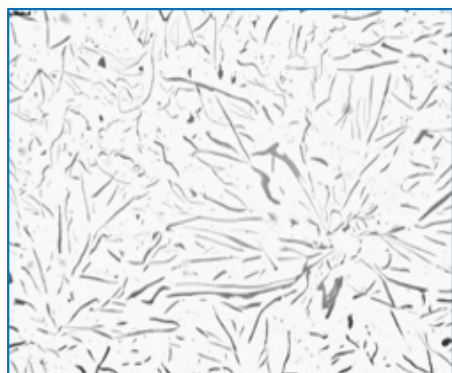
Nitrogen Porosity Morphology
氮气孔形态



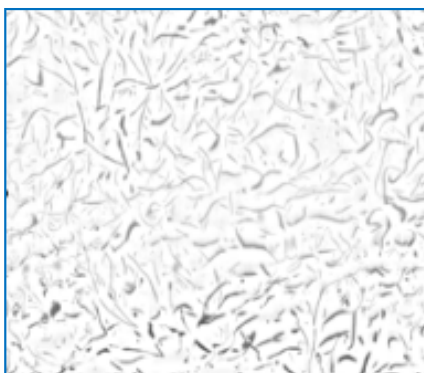
Nitrogen Porosity by SEM
氮气孔电镜图



Atlases of Energy Distribution
氮气孔能谱图



Iron With Nigtrogen 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, nickle, 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 126ppm 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 chinaweiyepds@pds.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: chinaweiyepds@pds.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, convenience, and advanced performance in the analysis of 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 methods 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 shutter protects internal components and serves 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 for 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 attachable 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

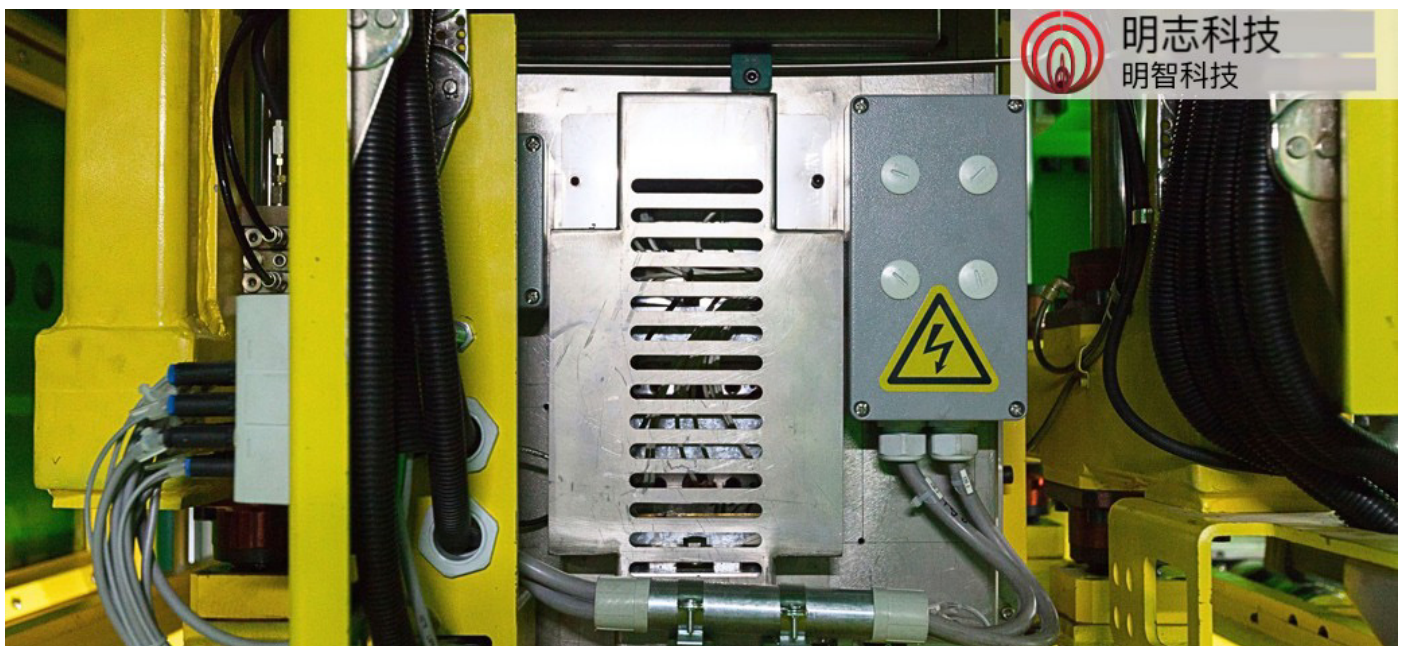
用于增强型砂芯生产的集成式气体加热器

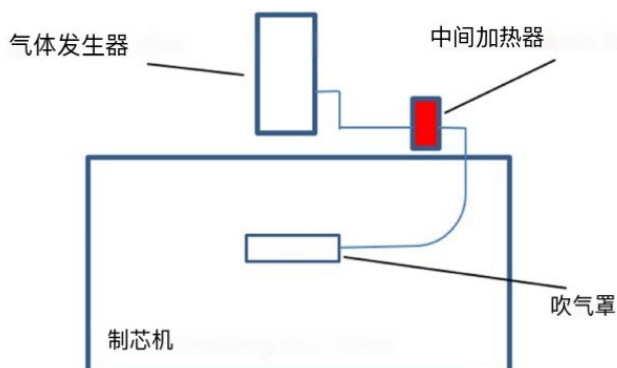
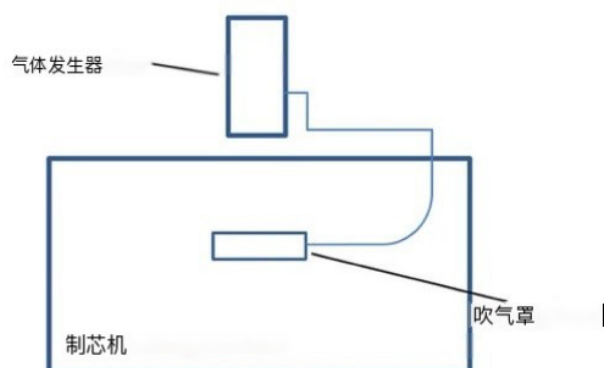
Mingzhi Technology Explores an Innovative Approach to Heating in Core Making for Improved Efficiency and Environmental Impact.

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:

Addition of 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：

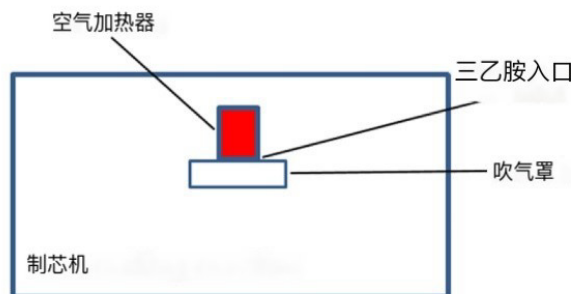
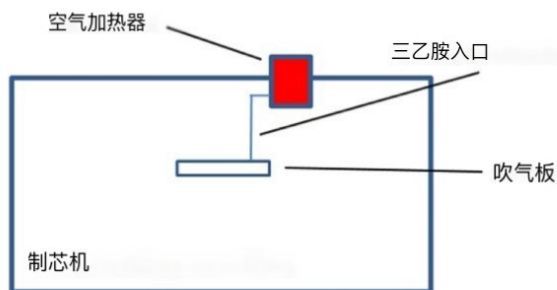
1. 添加中间加热器：

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 manufacturing.

2. Use of a single compact heater:

By consolidating heating functions 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 reducing curing time.

3. Creation of 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.

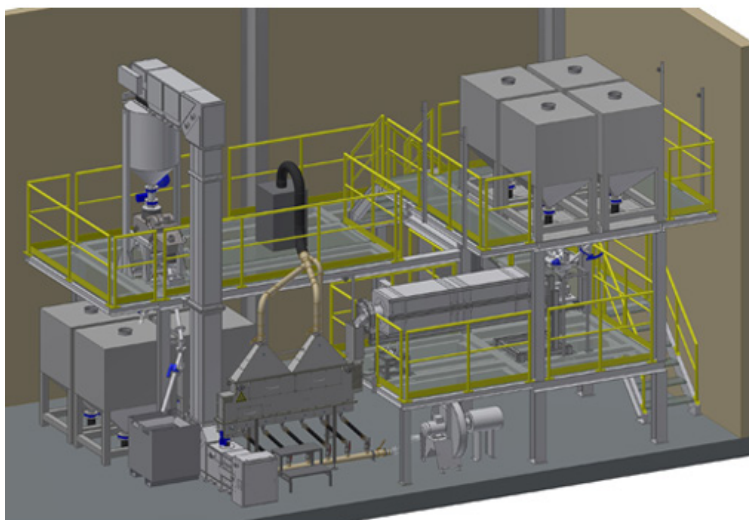
Michael Becker, the managing partner of Becker CCC, believed in the success of the overall concept and provided the funds for the prototype. And rightly so, because the system runs successfully and regenerates - around the clock on working days in semi-automatic mode - job box moulding material that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





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