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75TH WORLD FOUNDRY CONGRESS: NEW TRENDS IN DEVELOPING OF FOUNDRY

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The World Foundry Congress is held every two years. It is organized by the World Foundry Organization (WFO) and its member on a rotating basis. The first World Foundry Congress was held in 1923 in France, and since then, it has become a landmark international event. For over a century, the World Foundry Congress has made a great contribution to the development and exchange of scientific achievements and innovations in the foundry industry around the world, and has also contributed to the improvement of foundry technology in different countries, which provides substantial support for the progress of human civilization.

The 75th World Foundry Congress was held in Deyang, Sichuan Province, People's Republic of China (PRC) from October 25 to 30, 2024. In 2024, China hosted the World Foundry Forum for the third time; similar forums were successfully held in Beijing in 1995 and in Hangzhou in 2010. This level of trust from the world foundry community is undoubtedly due not only to China's status as recognized world power in the East, with more than 5000 years of history and numerous brilliant cultural heritage, but also to the outstanding history of the foundry industry, which has made a significant contribution to the development of the global foundry industry.

The organizers of such prestigious forum on the Chinese side were the China Foundry Association, Foundry Institution of Chinese Mechanical Engineering Society, National Key Laboratory of Advanced Casting Technologies and the Shenyang Research Institute of Foundry. Co-organizers of the Congress were Tsinghua University, Harbin Institute of Technology, Southeast University, Northwestern Polytechnical University, Dalian University of Technology, University of Science and Technology Beijing, Northeastern University, Heifei University of Technology, Institute of Metal Research of the Chinese Academy of Sciences and others. Additionally, the co-organizers and sponsors included leading companies and brands in the foundry industry, such as: SQ Group, xBang Technology, Foseco, HA Group, Voxeljet, SINYE materials technology, Supreium, JoYo Carbon, Sichuan dongshu new materials, Magma, ANY software and others.

As noted in the welcoming message by Dr. Lou Yanchun [1], Chairman of the Congress Organizing Committee, President of the Foundry Institute of the Chinese Mechanical Engineering Society (FICMES), President of the World Foundry Organization (WFO), in the flat period, thanks to the competent leadership and support of the Chinese government, the foundry industry continued to develop in a stable and orderly manner, which allowed China to become not only the largest casting manufacturer in the world during this period, but also the largest consumer market for foundry products.

The main events of the Congress took place at the Deyang Wende International Convention and Exhibition Center (Figure 1).

The motto of the 75th World Foundry Congress was «Development of Foundry Production», and the event itself brought together over 1,500 participants: scientists, experts and industry leaders in the field of foundry production from more than 30 countries such as China, Poland, Turkey, Spain, USA, Japan, Great Britain, Germany, Slovakia, Slovenia, Austria, Denmark, India, Australia, Belarus, Hong Kong, Egypt, France, Norway, Nigeria, Brazil, Italy, South Korea, Romania, Sweden, Netherlands, Singapore, France, Vietnam, Thailand, Malaysia, Switzerland, Finland and others. During WFC were discussed development trends and tendencies in foundry production, current problematic issues, presenting the results of the latest research and scientific achievements, as well as presenting advanced technologies used in foundry production within the framework of discussions, various meetings and events. These discussions significantly contributed to strengthening international cooperation among professionals directly and indirectly involved in the foundry sector.

Fig. 1.

The Opening ceremony of the 75th World Foundry Congress was held in the main conference hall of the Deyang Wende International Convention and Exhibition Center. The event was moderated by WFO Secretary General José Javier González (Spain). On behalf of the Congress Executive Committee, he warmly welcomed Chinese and international representatives, acknowledging their participation and introducing the honored guests (Figure 2), including Lou Yanchun (China), WFO President; Ding Wenjiang (China), Academician of the Chinese Academy of Engineering, Professor of Shanghai Jiaotong University, Director of the National Non-Ferrous Alloy Engineering Research Center; Liu Guangqiang (China), Deputy Secretary of the Deyang City Party Committee; Pan Fusheng (China), Doctor, Professor of Chongqing University, Chairman of the WFO Executive Committee; Carsten Kulgatz (Germany), WFO Vice President; Rafal Danko (Poland), Professor of the AGH Academy of Mining and Metallurgy and the University of Leicester; Dong Hongbiao (USA), Member of the US National Academy of Engineering, Research Fellow of the Lightweight Materials Research Institute of Ohio University; Andy Zhang Li Bo (China) – Chairman of the China Foundry Association; Kimura Hiroyoshi (South Korea) – former WFO President, member of the WFO Executive Committee.

Academician Ding Wenjiang delivered a welcoming speech at the opening ceremony, emphasizing that China is the world's largest producer of castings and a leader in foundry technology. He highlighted the country's ongoing modernization efforts to improve the level of foundry equipment and continuously enhance casting quality. He noted that high results have been achieved in the production of castings for the aerospace, automotive, railway, machine tool and electrical industries, and active R & D is being carried out in the field of power equipment and internal combustion engines. Each year, numerous high-quality and highly professional foundry enterprises emerge in China, continuously evolving through technological advancements. Ding Wenjiang called for strengthening international cooperation and deepening mutual exchanges, aiming to further develop the global foundry industry and accelerate advancements in foundry technology.

On behalf of the Deyang Municipal Party Committee and the Deyang Municipal Government, Liu Guangqiang delivered a welcoming speech, congratulated on the successful opening of the 75th World Foundry Congress

Fig. 2.

and expressed gratitude for Deyang becoming the venue for such a significant forum. In turn, Chairman Lou Yanchun, speaking on behalf of the World Foundry Organization (WFO) Executive Committee, emphasized that WFO is a global knowledge-sharing platform in the foundry industry. As a promoter and leader of technological progress, WFO is responsible for advancing and addressing critical challenges in manufacturing development and contributing to the progress of human civilization. He expressed hope that foundry organizations worldwide would continue to strengthen cooperation and exchanges to promote the digitalization and environmental sustainability of the global foundry industry. He highlighted that these transformations are now evolving rapidly through artificial intelligence and green technologies.

For the 75th World Foundry Congress, the organizing and scientific committee selected and presented 9 plenary reports (Figure 3). Among them, the reports of Pan Fusheng (academician of the Chinese Academy of Engineering, professor of Chongqing University, China) on the topic of «Development and application of magnesium-based materials», Rafal Danko (professor of the AGH University of Science and Technology, chairman of the Polish Foundry Association, Poland) on the topic of «Towards a green foundry – sustainable

Fig. 3.

development», Hongbiao Dong (Royal Engineers Company, professor of the University of Leicester, UK) on the topic of «University Data Analysis Framework – Realizing Industry 4.0 Industrial collaboration», Alan Aihua Luo (National Institute of Engineering, USA, director of the Lightweight Materials Research Institute, Ohio University, USA) on the topic of «Artificial intelligence and integrated computational materials engineering for sustainable foundry», Sun Baode (professor of Shanghai Jiaotong University, China) on the topic of «Optimization of large, complex and thin-walled castings made of heat-resistant alloys. Progress in Research in Precision Casting», Iulian Riposan (Romanian Technical University, Honorary Member of the Academy of Arts and Sciences of Romania, Romania) on «Oxidation Behavior of Si/SiMo Ductile Iron», Yasuhiro Maeda (Professor, Datong University, Japan) of the topic of «Investigation of the Behavior of High-Temperature Sand-Clay Mixture under Air Cooling and Spraying», Lu Yanchunya (President of WFO, China) on «High-Performance Precision Casting Technology for Large and Complex Titanium Alloy Castings» and Primož Mrvar (Head of the Department of Casting, Faculty of Science and Engineering, University of Ljubljana, Slovenia) on «Diagnostics of Non-Metallic Inclusions in AlMg6Si2MnZr Alloy».

Within the framework of these forums, various sessions were held, allowing participants and guests of the Congress to present their reports and engage in Q&A discussions.

A number of forums were held within the framework of the Congress such as: die casting technologies forum, high-precision casting technologies forum, an international forum of steel and iron casting manufacturing technologies, a forum of postgraduate students, a forum on molding materials and technologies, a forum of genetic (hereditary) engineering materials, a forum of superalloys and a global forum of young scientists.

Within the framework of the named forums, 16 sections were conducted, where Congress participants and guests had the opportunity to present their reports and actively engage in discussions through a Q&A format.

The sessions of the 75th World Foundry Congress covered a wide range of topics, including steel and iron casting technologies, non-ferrous alloys, high-entropy alloys, high-temperature alloys, metal matrix composite materials, rare earth materials, functional materials, genetic (hereditary) engineering materials, casting technologies for railway transportation, die casting and investment casting, high-precision casting, additive manufacturing, digital and smart casting technologies, molding materials and technologies, green and low-carbon foundry development.

The 75th World Foundry Congress organizing committee and experts selected 45 presentations for poster conference (Figure 5).

Fig. 4.

Fig. 5.

The 75th World Foundry Congress was closely integrated with the International Foundry Industry Exhibition. On an exhibition area of over 8,000 m², a total of 123 companies and research institutes showcased their cutting-edge developments (Figure 6).

As part of the 75th World Foundry Congress (WFC 2024), an exhibition was organized along with the conclusion of the International Foundry Photography Competition «Shengquan Cup 2024.» This annual competition is hosted by the Foundry Journal Agency and aims to capture extraordinary moments in the work and lives of foundry professionals, showcasing their aesthetic and spiritual dimensions through photography.

The best photographs were exhibited, and their authors were awarded valuable prizes in recognition of their outstanding contributions.

Within the framework of the Congress, a meeting of the WFO General Assembly was held (Figure 8).

During the session, reports were presented on the state of the foundry industry in each of the WFO member countries represented in person, along with online presentations from other WFO members. Discussions also addressed the support of young scientists, and it was officially announced that the 76th World Foundry Congress will be held in Turkey in 2026.


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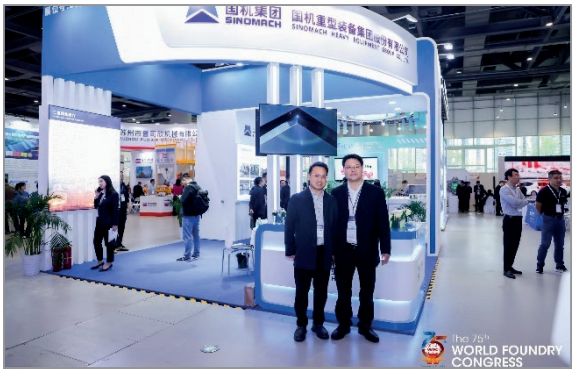
WORLD FOUNDRY CONGRESS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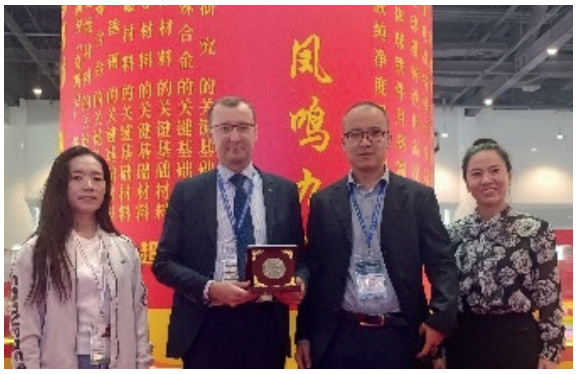

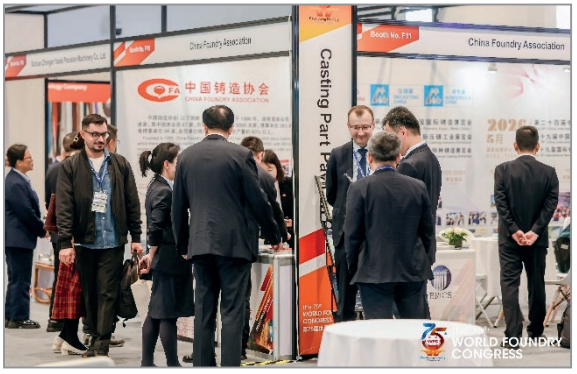
China Foundry Association
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Fig. 6.

At the Closing Ceremony of the 75th World Foundry Congress, Lu Yanchun summarized the outcomes of the event, expressed gratitude to the experts, scientists and delegates of the Congress who made great efforts to hold it, and also extended thanks to the organizers and sponsors.

At the closing ceremony, the Congress banner (Figure 8) was ceremonially handed over from the organizers of the 75th World Foundry Congress (WFC 2024) – the People's Republic of China to the organizers of the 76th World Foundry Congress (WFC 2026) – the Republic of Turkey. Deputy Chairman of the Turkish Foundry Association Mehmet Özalp expressed his appreciation for the scale and success of the current Congress and committed himself to the successful organization and holding of the 76th World Foundry Congress (WFC 2026).


2024
INTERNATIONAL FOUNDRY INDUSTRY
PHOTOGRAPHY EXHIBITION
2024
INTERNATIONAL FOUNDRY INDUSTRY
PHOTOGRAPHY EXHIBITION

Fig. 7.


WORLD FOUN
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Xie Huasheng

Fig. 8.


October 28, 2024
WFO
World Foundry Congress
October 28, 2024
WFO

Fig. 9.