



**73rd World
Foundry Congress**
"Creative Foundry"
23rd-27th September 2018
Krakow, Congress Centre, Poland



Polish
Foundrymen's
Association



World
Foundry
Organization

73rd World Foundry Congress – meeting of foundrymen from all over the world

On September 23rd-27th this year in Krakow the 73rd World Foundry Congress took place. By the decision of the World Foundry Organization (WFO) authorities made a few years ago, Polish Foundrymen's Association (STOP), which is the founding member of WFO, became the main organizer of the Congress. The honorary patronage over the Congress was taken by the President of the Republic of Poland Andrzej Duda, and the Honorary Committee was composed of: Jarosław Gowin - Minister of Science and Higher Education, Jacek Krupa - Marshal of the Małopolska Region, Jacek Majchrowski - Mayor of the City of Kraków, Tadeusz Słomka - Rector of the AGH University of Science and Technology in Krakow, Ewa Mańkiewicz-Cudny - President of the Polish Federation of Engineering Associations FSNT-NOT and Mark Fenyes - President of the World Foundry Organization.

The 73rd World Foundry Congress began on September 23rd this year. On this day, a tour of the city and a Welcome Party at the ICE Congress Center in Krakow were organized for participants of the Congress.

The official Congress Opening Ceremony took place on September 24th. During the opening, in the auditorium of the ICE Congress Center, participants were welcomed by Tadeusz Franaszek - President of the Polish Foundrymen's Association, Tadeusz Trzmiel - Deputy Mayor of the City of Kraków and Tadeusz Słomka - Rector of the AGH University and Mark Fenyes – President of World Foundry Organization. During the opening ceremony, the organizers thanked all the Sponsors, handing them commemorative statuettes. Part of the official opening was honored by AGH Song and Dance Ensemble "Krakus" whose performance has introduced more than 900 people to the atmosphere of Krakow. The performance was complemented by a promotional film showing the diversity of landscapes and culture that the participants of the congress have the opportunity to learn about when visiting Poland.

The opening ceremony of the Congress was also distinguished by the plenary session, during which three papers were presented. The first of them was authored by Dr. Carsten Kuhlitz, President of Hüttenes-Albertus Chemische Werke GmbH entitled "Development of the electric vehicles market by 2030 in Germany, Europe, US and China", second was given by Prof. Natalia Sobczak - Chairman of the Scientific Committee of the Congress, representative of the Foundry Institute in Krakow which title was "Liquid metal engineering for Creative Foundry: from Lab to Fab" and a closing lecture of the official part given by Piotr Olszewski presenting the latest achievements of Jan Felczyński's Bell-founding Studio entitled "VOX PATRIS - the biggest swinging bell in the world", which was cast in the Foundry Metalodlew SA. This paper, illustrated with a film, presented the unusual skills of Polish founders.

On that day, a press conference was held, attended by representatives of industry media, both domestic and foreign, and Sponsors of the Congress. The conference was chaired by the President of the Polish Foundrymen's Association - Tadeusz Franaszek and the moderator of the conference was a representative of Foundry Planet Journal- Thomas Fritsch. After the press conference, the WFO authorities, the organizers of the Congress and representatives of the Krakow Festival Office planted a tree in the Avenue of Congress, commemorating this extraordinary event. The 73rd World Foundry

Congress was chosen for this honorable distinction from among many of this year's events that took place at ICE Kraków.

On 24th-25th September, 43 scientific and technical sessions took place at the ICE Congress Center, which were held simultaneously in 8 conference rooms. During this two days, meetings of two WFO Committees were also held: Metal Matrix Composites, Training and Professional Development, as well as CLLEFE meeting and meetings of the WFO and Past Presidents authorities.

During the two days of technical sessions an attractive tourist program was also organized for accompanying persons, who visited Salt Mine in Wieliczka, Old Town, Kazimierz and Nowa Huta districts as part of their trips.

An important element of the Congress was a two-day Seminar of Young Scientists, combined with a poster session on which 83 posters of young scientists and practitioners were presented. The Polish company PGO SA took patronage over this Seminar. (Polish Foundry Group) About 100 young people attended the Seminar - students, PhD students, young scientists and industry employees. Guest lectures were given by the President of Kimura Group Mr. Kazutoshi Kimura - "*Kimura Foundry Co., Ltd. Overview*" and Dean of the Faculty of Foundry Engineering of the AGH University Prof. Rafał Dańko - "*The state of art and foresight of world casting production*". These papers presented foundry techniques that were aimed at encouraging young casters to constantly improve their skills and stay in foundry professions. During this Seminar, the Scientific Committee has chosen the best abstract. The award went to Y. Yoshitake, from the National Institute of Technology, Support Center of Education and Research, Japan for the paper entitled "*Grain refinement of Al-2% Cu alloy using by vibrating mold*". The prize was funded by Patron Young Researchers' Semiar - company PGO SA.

The Congress was accompanied by two exhibitions: historical "*Foundry industry over the centuries*" by Jerzy J. Sobczak, Tadeusz Franaszek and Jan Witkowski, and the exhibition "*Creative Foundry*", which was attended by over 50 companies from around the world. This exhibition, co-organized by Międzynarodowe Targi Poznańskie, was organized on two levels at the ICE Congress Center and covered a total of over 500 m².

Each day of the Congress ended with an integration meeting for its participants. On September 24th, participants took part in a solemn banquet in the charming Zalesie Manor House near Wieliczka and on September 25th they were invited by the Rector of the AGH University of Science and Technology in Krakow to a Cocktail Party that was held in the main building of the University. Where accompanied by the sounds of the National Brass Orchestra of AGH, the participants conducted talks, inspired by the unique international exhibition of crystals.

On 26th September an excursion session was organized for the participants of the congress to visit the METAL Fair in Kielce. Participants of the Congress had the opportunity to visit the exhibition organized as part of the XXII International Fair of Technology for METAL Foundry. An annual meeting of the WFO authorities was held during that day at the Kielce Trade Fairs.

This day was crowned by Foundrymen's Night meeting combined with the closing ceremony of the Congress. The ceremony took place in Stara Zajezdnia in the historic Kazimierz district in Krakow. During the closing ceremony, the General Secretary of the WFO - Andrew Turner announced the winners in the categories Best Scientific Paper and Best Technical Paper. In the Best Scientific Paper category, the awards were given to:

First place award – H. Yasuda, K. Chatcharit, K. Morishita from the Department of Materials Science and Engineering, Kyoto University, Japan and A. Sugiyama from Osaka Sangyo University, Japan, for presentation entitled "*Time-resolved and in-situ 2D / 3D imaging of Solidification in Ductile Cast Iron*".

Second place award - F. Zanardi from Zanardi Fonderie S.p.A., Italy and G. Angella from National Research Council of Italy/Institute of Condensed Matter Chemistry and Technologies for Energy

(ICMATE), Italy, for presentation *“Microstructure quality assessment of isothermed ductile irons through tensile tests”*.

Tird place award - I. Vicario Gomez i I. Crespo z TECNALIA RESEARCH & INNOVATION, Hiszpania, D. Val z Engineering, Grupo Antolin Ingeniería S.A, Spain, U. Weiss z Simulation, Ford Research & Innovation Center Aachen, Germany, D. Cao z Grupo Antolin Ingeniería S.A, Spain and Martinez de la pera I. z Engineering, Aurrenak, S. Coop, Spain, for presentation entitled *“Development of a squeeze semisolid high pressure die casting process for magnesium structural parts”*.

Statuettes for the best papers have been funded by AnyCasting Company.

In addition, the Board of Directors of WFO distinguished two scientific papers:

1. V. Deev from National University of Science & Technology (MISIS), Department of Foundry Technology, Russian Federation, E. Ri from Pacific National University, Department of Foundry Engineering and Metal Technology, Russian Federation and E. Prusov from Vladimir State University named after Alexander and Nikolay Stoletovs, Department of Functional and Constructional Materials Technology for presentation entitled *“Effect of aluminum melt treatment by nanosecond electromagnetic pulses on structure and properties of castings”*.

2. L. Elmquist from Swerea SWECAST, Research and Business Development, Sweden, S. Hall from Lund University, Division of Solid Mechanics, Sweden, T. Sjögren and E. Dartfeldt from Research Institutes of Sweden, RISE Safety and Transport/Mechanics Research, Sweden with P. Skoglund and J. Elfsberg from Scania CV AB, Sweden, M. Majkut z European Synchrotron Radiation Facility, France, for presentation entitled *“Mechanical and structural characterization of cast iron using synchrotron light”*.

In the category of Best Technical Paper awards went to:

First place award: Y. Tomita, H. Fujji from Kimura Foundry Company, Japan and J. Izaga with I. Gallestegi from IK4-Azterlan, Spain for presentation entitled *“Cast Components in Super Duplex Alloys Intercomparison between bench moulding and 3-D printing”*.

Second place award: T. Kanno from Kimura Foundry Company, Japan for presentation entitled *„Problems and improvements on the production of large castings with Hi Silicon ductile iron”*.

Third place award R. Lencina, E. Henry-Lanier from Kerneos Aluminate Technologies, France and Y. Roux from Procastyr, France for presentation entitled *„Process performance and environmental impact of CaO-Al₂O₃ slag system as an alternative to calcium carbide for desulphurisation of Nodular Iron”*.

The awards for the Best Technical Papers were founded by Hüttenes- Albertus Company.

During this ceremony, the WFO flag was handed over to the next organizer of the congress - the Korean Foundry Association. The Korean representatives presented a promotional film, inviting everyone to Busan, where in 2020, another 74th World Foundry Congress will take place.

The last day of the Congress, the 27th September, was devoted to technical tours, allowing the participants to become acquainted with the capabilities of the Polish foundry industry and its scientific and research facilities.

7 technical excursions were organized, including: Odlewnia Metalodlew SA, Odlewnie Polskie SA, and Metalpol Węgierska Górka Sp. z o.o., Zakład Metalurgiczny WSK Rzeszów, Nematik Poland, AGH and Foundry Research Institute, Vesuvius.

In total, 930 participants from 43 countries took part in the 73rd World Foundry Congress, including 323 participants from Poland, 99 from Germany, 72 from Japan, 49 from China, 45 from Spain, 35 from India and 30 from Turkey. 56% of Congress participants represented the industry. Among them, 50% were representatives of suppliers of machinery and equipment for foundries (21%)

and representatives of material suppliers (28%). The other participants represented, among others, iron foundries (26%), cast steel foundries (10%) and foundries of non-ferrous metals (8%).

Young scientists – students, young researchers and industry workers constituted a large group, of about 100 participants, during the Congress. 45 people were registered as accompanying persons.

383 abstracts were registered for the Congress. 202 scientific and technical presentations were given during 43 sessions, which were led altogether by 86 chairmen from all over the world. 181 posters were presented during a two-day poster sessions, including 83 brought by young scientists.

The majority of abstracts were submitted in the field of materials (55%) and technologies (33%). Only 5% of all abstracts were registered in the subject of digitalization, 4% in ecology and 3% in management.

All congress publications were published in the Book of Abstracts, which was published in an electronic version and in a limited number in a paper version.

The organizers of the Congress together with the Scientific Committee have created an opportunity for the authors to publish full texts based on the Congress abstracts in one of 6 journals - for scientific publications in the Archives of Metallurgy and Materials, Archives of Foundry Engineering, Journal of Materials Engineering and Performance, Journal of Casting & Materials Engineering or International Journal of Metalcasting, for technical publications in the Foundry Trade Journal. Authors, as many as 65% of all who submitted their abstracts, declared their willingness to make a post-congress publication in one of the recommended journals.

The organization of such a large and extraordinary event was possible due to the unusual involvement of the Secretariat of the Main Board of the Polish Foundrymen's Association, Organizing and Scientific Committees, Foundry Engineering Department of the AGH University of Science and Technology, many Polish foundries and companies that cooperated with the Organizing Committee and accepted the Congress participants during technical excursions, numerous entities supporting the technical organization of the event, 14 Media Partners supporting promotional activities and 17 Sponsors of the Congress, including 3 Gold - Hüttenes-Albertus, Clariant, Poznań International Fair, 2 Silver: Targi Kielce, Foseco, 10 Bronze - ASK Chemicals, Ferro-Term sp. z o.o., General Kinematics, Inductotherm Group, Kimura Foundry Co, Ltd, Metalpol Węgierska Górka Sp. z o.o., Odlewnie Polskie SA, Omega Machinery, Silum Sp. z o.o., Odlewnia Żeliwa Wulkan SA and 2 Sponsors: ESI and Messe Düsseldorf.

We would like to thank all the authors for their scientific and technical contribution ensuring a high scientific and technical level of the congress. We thank all exhibitors for creating, together with the Poznań International Fair, an interesting, innovative exhibition "Creative Foundry" and all participants whose high numbers confirmed the prestige and the need to organize this unique global casting event, an industry that is highly rated in all developed, modern societies and countries around the world.

Special thanks go to Sponsors of the Congress, thanks to whose financial support, it was possible to organize such a high-level event and to Media Partners who actively supported the promotion of the Congress.

We also thank the authorities of the World Foundry Organization (WFO) for the decision to entrust our Association with the organization of this international event, which allowed us to once again confirm our commitment and organizational skills.