

Program of the Conference

27 September 2023		
12.00 - 14.00 Registration of participants		
14.00 - 17.30 Conference Opening, Plenary Session		
18.00 Dinner		
20.00 - 21.30 Košice in the Evening (walking tour)		
28 September 2023		
Lectures		
09.00 - 10.40 Session: Iron and Steelmaking (Conference hall 1)	09.00 - 10.30 Session: Foundry, Non Ferrous and Non - Metallic Materials (Conference hall 2)	09.00 - 10.30 Session: Recycling of waste from metallurgical processes (Conference hall 3)
Coffee break		
11.00 - 12.00 Session: Process simulations (Conference hall 1)	10.50 - 12.30 Session: Decarbonisation and Energy Transformation in Industry (Conference hall 2)	11.00 - 12.00 Session: Recycling of waste from metallurgical processes (Conference hall 3)
12.00 – 14.00 Lunch (Main Restaurant)		
14.00 – 15.45 Poster session (Conference hall 3)		
19.00 Social evening (Main Restaurant)		
29 September 2023		
09.00 - 12.00 Excursion to the company U.S.Steel Košice, s.r.o.		
09.00 - 12.00 Presentation laboratories of the Faculty of Materials, Metallurgy and Recycling, Technical University of Košice		
09.00 - 11.00 Round Table Meeting (Individual meeting of participants)		
11.00 - 11.30 Summary and evaluation of the conference (Organizer committee of conference)		
11.30 - 12.00 Conclusion of the conference		

27 September 2023

12.00 - 14.00 Registration of participants

14.00 - 17.30 Plenary Session I

Chairmen: doc. Ing. Branislav Buľko, PhD., doc. Ing. Karel SaksI, DrSc., prof. Ing. Peter Mésároš, PhD., RNDr. Miroslav Kiraľvarga, MBA, dr hab. inž. Kinga Rodak, prof. PŠ, doc. Ing. Karel Gryc, MBA, Ph.D.,

Conference hall 1

14.00 - 14.10 CONFERENCE OPENING BY GUARANTEE OF THE CONFERENCE
Branislav Buľko - Faculty of Materials, Metallurgy, and Recycling

14.10 - 14.20 CONFERENCE OPENING BY GENERAL PARTNER OF CONFERENCE, U. S. STEEL KOŠICE
Miroslav Kiraľvarga - U. S. Steel Košice, s.r.o

14.20 - 14.50 FACULTY OF MATERIALS, METALLURGY AND RECYCLING TUKE - THE VISION OF ITS DEVELOPMENT, EDUCATION, AND RESEARCH
Karel SaksI - Faculty of Materials, Metallurgy and Recycling

14.50 - 15.20 FACULTY OF MATERIALS ENGINEERING, SILESIAN UNIVERSITY OF TECHNOLOGY
Kinga Rodak - Faculty of materials engineering

15.20 – 15.35 FACULTY OF MATERIALS SCIENCE AND TECHNOLOGY, VSB – TECHNICAL UNIVERSITY OF OSTRAVA
Bedřich Smetana - Faculty of materials science and technology

15.35 - 16.00 Coffee break

16.00 - 17.30 Plenary Session II

Chairmen: doc. Ing. Branislav Buľko, PhD., doc. Ing. Karel SaksI, DrSc., Dr. h. c. mult. prof. Ing. Jozef Zajac, CSc., Ing. Adrián Jakubek, Ing. Juraj Sabol, MBA, Dr hab. inž. Marek Warzecha, prof. PCz

Conference hall 1

16.00 - 16.30 DIGITAL TRANSFORMATION OF INNOVATION ECOSYSTEMS
Radoslav Mizera - Solved

16.30 - 17.00 DECARBONIZATION OF U.S.STEEL KOŠICE, S.R.O.
Juraj Sabol - U.S.Steel Košice, s.r.o.

17.00 - 17.30 CHEMICAL LEGISLATION AND ITS UPDATES
Petra Králová - EUROFER

18.00 Dinner

20.00 - 21.30 KOŠICE IN THE EVENING (walking tour, meeting point in front of the hotel)

28 September 2023

Lectures

- 09.00 - 10.30 **Session: Iron and Steelmaking** - [Conference hall 1](#)
- 09.00 - 10.30 **Session: Foundry, Non Ferrous and Non - Metallic Materials** - [Conference hall 2](#)
- 09.00 - 10.30 **Session: Recycling of waste from metallurgical processes** - [Conference hall 3](#)
- 10.50 - 12.50 **Session: Decarbonisation and Energy Transformation in Industry** - [Conference hall 2](#)
- 11.00 – 12.30 **Session: Process simulations** - [Conference hall 1](#)
- 11.00 – 12.00 **Session: Recycling of waste from metallurgical processes** - [Conference hall 3](#)
- 12.00 - 14.00 Lunch
- 14.00 - 15.30 **Poster session** - [Conference hall 3](#)
- 19.00 Social evening

09.00 - 10.40 **Session: Iron and Steelmaking**

Chairmen: prof. Ing. Jaroslav Legemza, PhD., prof. Ing. Bedřich Smetana Ph.D., dr hab. inž., Jacek Pieprzyca, prof. PŚ

[Conference hall 1](#)

- 09.00 - 09.20 DEVELOPMENT OF A PHYSICOCHEMICAL MODEL OF FE-SI-CR ALLOY SMELTING AND ITS IMPLEMENTATION FOR THE PRODUCTION OF NEW CHROME ORE REDUCERS - CROSIMAX ALLOYS
Sławomir Kozłowski, Bolesław Machulec, Wojciech Bialik, Stanisław Gil, Piotr Migas
- 09.20 - 09.40 THE INFLUENCE OF LIME REACTIVITY ON THE OXYGEN STEELMAKING PROCESS
J. Brankov, S. Nafornta, F. Ponchon, B. Bulko, R. Findorak, J. Legemza, P. Demeter, D. Baricova
- 09.40 - 10.00 STUDY OF THE TEMPERATURES OF PHASE TRANSFORMATIONS OF STEELS AND THEIR APPLICABILITY IN THE TECHNOLOGY OF STEEL CASTING
Michaela Strouhalová, Karel Michalek, Bedřich Smetana
- 10.00 - 10.20 INFLUENCE OF ADMIXTURES OF MINERAL ELEMENTS IN REDUCING AGENTS ON THE STRUCTURE OF FERROALLOYS FeSi AND FeSiCr
Wojciech Bialik, Stanisław Gil, Tomasz Pawlik, Sławomir Kozłowski, Konrad Kottun

09.00 - 10.30 **Session: Foundry, Non Ferrous and Non - Metallic Materials**

Chairmen: doc. Ing. Iveta Vasková, PhD., Ing. Ruslan Mulik, Ing. Peter Šebek

[Conference hall 2](#)

- 09.00 - 09.20 DETERMINING OPERATING PARAMETERS OF AN ELECTRIC FURNACE FOR CASTING OF BRONZE AGE REPLICAS

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Martin Čižmár, Miroslav Variny, Tomáš Kurák

09.20 - 09.40 THEORY OF ROTARY DEGASSING

Ondrej Fazekaš

09.40 - 10.00 QUALITY ASSESSMENT OF ALUMINIUM CASTINGS BY COMPUTED TOMOGRAPHY

Martin Pinta, Ladislav Socha, Karel Gryc, Jana Sviželová, Kamil Koza

10.00 - 10.20 INTRODUCTION TO THE METHODOLOGY OF QUALITY MONITORING OF ZINC ALLOY CASTINGS PRODUCED BY HPDC IN ADDITIVELY MANUFACTURED SHAPED MOULD PARTS

Kamil Koza, Karel Gryc, Ladislav Socha, Martin Pinta, Roman Kubeš, Václav Sochacký, Adnan Mohamed, Jaromír Trobl

09.00 - 10.30 **Session: Recycling of waste from metallurgical processes**

Chairmen: prof. Ing. Andrea Mišková, PhD., prof. dr hab. inž. Mariola Saternus, doc. Ing. Silvie Brožová, Ph.D.

Conference hall 3

09.00 - 09.20 EU REGULATORY CHALLENGES ON SUSTAINABILITY AND CIRCULARITY. THE FERROUS METALS PERSPECTIVE

Ľubor Kalafus

09.20 - 09.40 POSSIBILITIES OF RECYCLING WASTE FROM METALLURGY WITHIN THE RECYCLING CENTER AT THE INSTITUTE OF RECYCLING TECHNOLOGIES IN KOŠICE

Tomáš Vindt

09.40 - 10.00 GALVANIZED STEEL AND SUSTAINABLE CONSTRUCTION: SOLUTIONS FOR A CIRCULAR ECONOMY

Petr Strzyž

10.00 - 10.20 RECYCLING OF GALLIUM

Adam Bahno

10.30 - 11.00 Coffee break

11.00 - 12.00 **Session: Process simulations**

Chairmen: doc. Ing. Peter Demeter, PhD., doc. Ing. Ladislav Socha, Ph.D., MBA, Tomasz Merder dr hab. inž., prof PŚ

Conference hall 1

11.00 - 11.20 REFINING LIQUID STEEL WITH ARGON IN THE CONTEXT OF MODELLING RESEARCH

Saternus Mariola, Merder Tomasz, Pieprzyca Jacek

11.20 - 11.40 BADANIA MODELOWANIA FIZYCZNEGO PROCESÓW METALURGII STALI

Jacek Pieprzyca, Tomasz Merder, Mariola Saternus

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11.40 - 12.00 OPTIMIZING OF PIG IRON DESULFURIZATION USING PHYSICS-INFORMED NEURAL NETWORKS (PINNS)
Andrii Pylypenko, Peter Demeter, Branislav Buľko, Slavomír Hubatka, Lukáš Fogaraš, Jaroslav Legemza, Jaroslav Demeter

11.00 - 12.00 **Session: Recycling of waste from metallurgical processes**

Chairmen: doc. Ing. Dušan Oráč, PhD., MBA, Ph.D., prof. dr hab. inž. Mariola Saternus, doc. Ing. Silvie Brožová, Ph.D.

Conference hall 3

11.00 - 11.20 CHALLENGES AND LIMITATIONS FOR SOME METALS RECOVERY FROM CARBON STEEL EAF, FECR AND STAINLESS STEEL SLAGS
Andrea Miškuřová

11.20 - 11.40 CHEMICAL AND THERMAL ANALYSIS IN METALLURGY
Michal Karabín

11.40 - 12.00 TRANSITION FROM WASTE RECYCLING TO BY-PRODUCT PROCESSING
Olívia Melegová

10.50 - 12.30 **Session: Decarbonisation and Energy Transformation in Industry**

Chairmen: doc. Ing. Miroslav Variny, PhD., Ing. Ladislav Horváth, PhD., prof. dr hab. inž. Mirosław Karbowniczek

Conference hall 2

10.50 - 11.10 VALORIZATION OF CRUDE REFINERY'S BY-PRODUCT: A CASE STUDY ON HEAVY RESIDUES GASIFIER
Miroslav Variny, Slavomír Podolský, Tomáš Kurák

11.10 - 11.30 MULTI-CRITERIA EVALUATION OF ENVIRONMENTALLY FRIENDLY ALTERNATIVE FUELS
Dominika Kraviarová, Ján Janošovský, Miroslav Variny

11.30 – 11.50 PROBLEMY TECHNOLOGICZNE PRZY WDRAŻANIU NOWYCH STALI DLA ENERGETYKI
Janusz Adamiec, Katarzyna Łyczkowska, Katarzyna Baluch

11.50 – 12.10 INFLUENCE OF PROCESS PARAMETERS ON ENERGY CONSUMPTION IN A STEELMAKING ARC FURNACE
Piotr Migas, Mirosław Karbowniczek, Dariusz Józefiak

12.10 – 12.30 IMPACT OF ENERGY PARAMETERS OF THE POWER SUPPLY SYSTEM ON ELECTRICITY CONSUMPTION IN A STEELMAKING ARC FURNACE
Mirosław Karbowniczek, Piotr Migas, Dariusz Jozefiak

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14.00 - 15.40 **Poster session**

Chairmen: doc. Ing. Iveta Vasková, PhD.

Conference hall 3

- 14.00 - 14.05 THE EFFECT OF DIFFERENT SHAPED IMPACT PADS ON THE FLOW OF STEEL IN THE TUNDISH
Peter Demeter, Branislav Buľko, Róbert Dzurňák, Ivan Priesol, Slavomír Hubatka, Lukáš Fogaraš, Jaroslav Demeter
- 14.05 - 14.10 HYDROGEN ENRICHMENT OF NATURAL GAS: IMPLICATIONS FOR BURNER OPERATION
Róbert Dzurňák, Gustáv Jablonský, Katarína Pauerová, Richard Eliaš
- 14.10 - 14.15 EXTRACTION OF LEAD FROM HYDROMETALLURGICAL PROCESSING OF COPPER SHAFT FLUE DUST
Michaela Ružičková, Martina Laubertová, Jarmila Trpčevská, Alexandra Kollová, Zita Takáčová, Tomáš Vindt
- 14.15 – 14.20 OBTAINING USABLE PRODUCTS BY PROCESSING CONVERTER FLUE DUSTS FROM COPPER PRODUCTION
Alexandra Kollová, Martina Laubertová, Jarmila Trpčevská, Michaela Ružičková, Katarína Pauerová
- 14.20 - 14.25 PREPARATION OF ROTOR GEOMETRY FOR SETTING UP NUMERICAL MODEL OF FLOW IN REFINING LADLE
Lukáš Manoch, Ladislav Socha, Jana Sviželová, Karel Gryc, Adnan Mohamed
- 14.25 - 14.30 COMPREHENSIVE MATERIAL RESEARCH OF FE AND MN ORES AND ASSESSMENT OF POSSIBILITIES FOR THEIR REDUCTION WITH HYDROGEN
Jaroslav Legemza, Zuzana Miškovičová, Róbert Findorák, Peter Demeter, Slavomír Hubatka
- 14.30 - 14.35 ANALYSIS OF CURRENT KNOWLEDGE OF HYDROGEN APPLICATION AS A REDUCING AGENT IN METALLURGICAL PROCESSES OF IRON PRODUCTION
Zuzana Miškovičová, Jaroslav Legemza, Peter Demeter, Slavomír Hubatka, Martina Hrubovčáková, Peter Futáš
- 14.35 - 14.40 THE IMPACT OF IMPLEMENTING CARBON BORDER ADJUSTMENT MECHANISMUS ON THE STEEL INDUSTRY THROUGH 2034: A FORECASTING STUDY
Slavomír Hubatka, Branislav Buľko, Dana Baricová, Lukáš Fogaraš, Andrii Pylypenko, Dominik Dubec, Jaroslav Demeter, Peter Demeter
- 14.40 - 14.45 COMPARATIVE STUDY OF INNOVATIVE "SPHERIC" AND STANDARD IMPACT PAD SYSTEMS IN BOAT-TYPE TUNDISH
Lukáš Fogaraš, Slavomír Hubatka, Peter Demeter, Branislav Buľko, Andrii Pylypenko, Jaroslav Demeter, Dominik Dubec
- 14.45 - 14.50 APPLICATIONS OF TUNGSTEN ALLOYS IN THE ENERGY SECTOR

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Brožová Silvie, Macháčková Adéla, Slíva Aleš

- 14.50 - 14.55 RESEARCH AND DEVELOPMENT OF NEW HIGH-ENTROPY ALLOYS FOR HYDROGEN STORAGE
Dagmara Varcholová, Lenka Oroszová, Katarína Kušnírová Karel SaksI
- 14.55 - 15.00 STATE AND PERSPECTIVE OF FOUNDRIES IN SLOVAKIA
Ondrej Kožej, Iveta Vasková
- 15.00 - 15.05 THE BENEFITS OF USING AN ADVANCED MATERIAL FOR PRODUCTION OF SPHERICAL IMPACT PAD IN TUNDISH
Branislav Buľko, Peter Demeter, Ivan Priesol, Slavomír Hubatka, Lukáš Fogaraš, Jaroslav Demeter, Martina Hrubovčáková, Andrii Pylypenko, Dominik Dubec, Dagmara Varcholová, Oleksii Lapenko
- 15.05 - 15.10 THE IMPACT OF THE PRODUCTION OF CAST IRON CASTINGS IN A CUPOLA FURNACE ON THE ENVIRONMENT
Patrik Fedorko, Alena Pribulová, Jozef Petrik, Peter Blaško, Peter Futáš
- 15.10 - 15.15 COMPARISON OF DEGASSING EFFICIENCY ON A FOUNDRY DEGASSING UNIT USING DIFFERENT ROTOR TYPES
Jan Kolínský, Tomáš Prášil, Ladislav Socha, Jana Sviželová, Karel Gryc, Petr Nuska, Martin Dvořák
- 15.15 - 15.20 OPTIMISATION OF THE STEEL STRIP HEATING PROCESS BY CHANGING THE EXCESS COMBUSTION AIR
Šimon Staško, Gustáv Jablonský, Augustín Varga and Róbert Dzurňák
- 15.20 - 15.25 ACTIVE SURFACE OF THE PURGING PLUG ON THE EFFECTIVENESS OF THE ARGON BLOWING PROCESS IN THE LADLE
Merder Tomasz, Pieprzyca Jacek, Saternus Mariola, Wende Robert
- 15.25 - 15.30 STABILNOŚĆ STRUKTURALNA STALI MARTENZYTYCZNYCH DLA ENERGETYKI
Kinga Rodak
- 15.30 - 15.35 STEEL - APPLICATION OF THERMAL ANALYSIS METHODS
Bedřich Smetana, Simona Zlá, Monika Kawuloková, Lukáš Palička, Hana Matušková, Světlana Sorokina, Petr Dostál
- 15.35 – 15.40 EVALUATION OF FACTORS AFFECTING THE THICKNESS EVOLUTION OF THE MgO-C REFRACTORY LINING OF THE BOF
Jaroslav Demeter, Peter Demeter, Branislav Buľko
- 15.40 – 15.45 KIH TESTING OF API 5L X42 AND X52 SEAMLESS STEEL TUBES
Pavel Bekeč, Lucia Domovcová, Pavol Beraxa, Miloš Dekrét, Martin Domovec