

III International Scientific and Practical Conference

**«Development and design of modern  
materials and products»**



**PROGRAM**  
Dnipro, Ukraine  
November 26<sup>th</sup>-27<sup>th</sup>, 2024

## *Dear colleagues!*

Scientific society: employees of higher educational institutions and research institutes, including graduate students and students, as well as representatives of organizations and firms engaged in the field of knowledge-intensive business, welcome you to **the 3rd International Scientific and Practical Conference "Development and Design of Modern Materials and Products"**, organized on the basis of the Engineering and generative Design Department Dnipro University of Technology.

We are organizing a conference in the context of the Russian-Ukrainian war, which changed everything not only in Ukraine, in Europe, but also in the whole world.

We hope that such a conference is another opportunity to gather scientists from different directions and countries of the world, with the aim of preserving global scientific unity in such difficult conditions.

We are sure that the results of our joint work will be interesting and useful for all participants of the conference and will serve to solve modern problems of the world scientific community.

## CONFERENCE ORGANIZERS

- Dnipro University of Technology (Dnipro, Ukraine),
- Institute of Electric Welding named after E.O. Paton National Academy of Sciences of Ukraine (Kyiv, Ukraine),
- Institute of Ferrous Metallurgy. Z.I. Nekrasov National Academy of Sciences of Ukraine (Dnipro, Ukraine)
- KTH Royal Institute of Technology (Stockholm, Sweden)
- Freiberg University of Mining and Technology (Freiberg, Germany)
- Lutsk National Technical University (Lutsk, Ukraine)

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## PROGRAMM

### *NOVEMBER 26 9:15 AM – 4:00 PM – PLENARY MEETING*

**09:00– 09:15**– Registration of conference participants on the Microsoft Teams platform.

**09:00 – 9:15**– Реєстрація учасників конференції на платформі Microsoft Teams.

Speaker of the meeting

professor **Dmytro LAUKHIN**

Moderators

associate professor **Nataliia ROTT**  
**Ilya VERNER**

Microsoft Teams event  
link

[https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_OTI5YmI5NzQtOTM2NC00YzI3LTljNmQtMjg3MjA4NTY4NmJi%40thread.v2/0?context=%7b%22Tid%22%3a%226cbb82a7-8f8b-4e21-8922-e8dd1f03e636%22%2c%22Oid%22%3a%22fcfcfddf-6d37-4c63-a26b-5e111a1966cb%22%7d](https://teams.microsoft.com/l/meetup-join/19%3ameeting_OTI5YmI5NzQtOTM2NC00YzI3LTljNmQtMjg3MjA4NTY4NmJi%40thread.v2/0?context=%7b%22Tid%22%3a%226cbb82a7-8f8b-4e21-8922-e8dd1f03e636%22%2c%22Oid%22%3a%22fcfcfddf-6d37-4c63-a26b-5e111a1966cb%22%7d)

**09:15– 9:20** – Ceremonial opening of the international conference "Development and design of modern materials and products"

**9:20 – 09:25**– welcome speech of the rector of Dnipro University of Technology, professor **Oleksandr AZIUKOVSKYI**

**09:25- 09:30** - welcome speech of the head of the Engineering and Generative Design Department **Serhii FEDORIACHENKO**

**09:30 Act speech of conference participants**

The schedule of the report is up to 10 minutes.

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**09:30 - 09:50** «*Features of the structure of wear resistant coatings obtained by multi-chamber detonation spraying*» **BERDNIKOVA Olena, E.O.** Paton Electric Welding Institute of the NAS of Ukraine

**09:50 - 10:00** «*Pharmaceutical coating in the form of a film for solid oral medicines*» **ANDRIIUK Valeria, NAUMENKO Olena,** Dnipro University of Technology

**10:00 - 10:10** «*Optimization of the components of composite materials using the experiment planning method*» **CHEMAKINA Oktyabrina, POVZUN Oleksiy** National Aviation University

**10:10 - 10:20** «*Waste management from buildings and structures damaged or destroyed by warfare. major issues and solutions*» **DADIVERINA Liliia, VOLODYMYR Bondarenko,** Dnipro University of Technology

**10:20 - 10:30** «*Titanium powder materials of non-spherical shape for additive technologies*» **DZHUGAN Oleksandr, KYRYLAKHA Svitlana,** National University «Zaporizhzhia Polytechnic

**10:30 - 10:40** «*Prospects for obtaining fine-grained and powdered materials from destroying waste in the area of their formation*» **FEDOSKINA Olena,** Dnipro University of Technology

**10:40 - 10:50** «*Analysis of modern materials for creating protective structures*» » **HARKAVENKO Dmytro,** Dnipro University of Technology

**10:50 - 11:00** «*Improvement of the design of the fitness hook model with explanation of the material and manufacturing technology*» **KOLESNYK Illia, SAZANISHVILI Zoia,** Dnipro University of Technology

**11:00 - 11:10** «*Potential and prospects of using alternative fuels in piston engines of hybrid power systems*» **KRIVDA Vitalii, DEGTYARYOV Danilo**, Dnipro University of Technology

**11:10 - 11:20** «*Fly ash from thermal power plants – a valuable technogenic raw material in the manufacturing of composite materials*» **LAPSHIN Yevhen, SHEVCHENKO Oleksandr, VERNER Ilya**, M.C. Polyakov Institute of Geotechnical Mechanics of the National Academy of Science of Ukraine

**11:20 - 11:30** «*Material scientific fundamentals of the application of high-strength, high-viscous steels for special-purpose structures*» **LAUKHIN Dmytro, ZIBOROV Kyrylo, SOLOVIOV Ivan, FILATOV Valeriy, VOLODYMYR Bondarenko**, Dnipro University of Technology

**11:30 - 11:40** «*The choice of material and design for a reusable bionic filter*» **LUKIN Anton, LAUKHIN Dmytro, MATSIUK Iryna**, Dnipro University of Technology

**11:40 - 11:50** «*Self-reinforcement of high-entropy aluminum alloy during electron-beam sintering*» **NAKONECHNYI Serhii, YURKOVA Alexandra, LOBODA Petro**, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”

**11:50 - 12:00** «*Study of multilayer wearproof film coating of cold handind processing tools*» **NAUMENKO Olena**, Dnipro University of Technology

**12:00 - 12:10** «*Properties of geopolymeric materials based on expanded perlite*» **POLIVODA Nina, FESHCHUK Yurii, MELNYCHUK Mykola, SHEVCHUK Igor, BABYCH Yaroslav**, Lutsk national technical university,

**12:10 - 12:20** «*The choice of design and material of sun protection coating for roofs of small-sized buildings*» **ROMANETS Maria., LAUKHIN Dmytro, MATSIUK Iryna**, Dnipro University of Technology

**12:20 - 12:30** «Using metallic glass in clothing to enhance its physical properties», **SAVITSKY Ivan, LAUKHIN Dmytro, MATSIUK Iryna**, Dnipro University of Technology

**12:30 - 12:40** «Analysis of the impact of electron beam welding on the structural parameters of welded joints of steels 09G2S, 10HSND, and 10G2FB using factor analysis» **SLUPSKA Yuliia**, Dnipro University of Technology

**12:40 - 12:50** «*Formation of the structure and phase composition of the high-entropy w1.5feconi alloy in the process of mechanical alloying*» **TESLYA Serhii, NAKONECHNYI Serhii, YURKOVA O.I., LOBODA P.I.**, National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”

**12:50 - 13:00** «*Restraining factors for the use of 3d printing technology in the construction industry*» **YELISIEIEVA Marina**, Dnipro University of Technology

**13:00 - 13:10** «*Choice of ecological material for the construction of a modular house*» **ZHARKO Hanna, MATSIUK Iryna**, Dnipro University of Technology

**13:10 - 13:20** «*Study of the relationship between the structural state and the formation of fracture surfaces of low-carbon microalloyed steels*». **LAUKHIN Dmytro**, Dnipro University of Technology, **BEKETOV Oleksandr, MAMCHUR Denys, RADKO Oleksandr**, SEI “Prydniprovsk State Academy of Civil Engineering and Architecture”

**13:20 - 13:30** «*Physical modeling of plastic deformation propagation in low-carbon low-alloy steels in the ferritic-pearlite structural state*» **BEKETOV Oleksandr, TYKVENKO Pavlo, LAKSHA Vitalii, OPANASENKO Andrii**, SEI “Prydniprovsk State Academy of Civil Engineering and Architecture”

**13:30 - 13:40** «*The main stages of building a physical model of the fracture of the bainite component of the structure of low-carbon microalloyed steels*» **LAUKHIN Dmytro**, Dnipro University of Technology, **BEKETOV Oleksandr, KUZNETSOV Serhii, NESTERKIN Oleksandr**. SEI “Prydniprovsk State Academy of Civil Engineering and Architecture”

**13:40 - 13:50** «*Prospects for the use of composite reinforcement in the construction industry*» **PILIUHIN Yevhenii, ROTT Nataliia**, Dnipro University of Technology

**13:50 - 14:00** «*Non-metal fracture tracking research while continuous casting*» **KOROL Vadym, FEDORIACHENKO Serhii**, Dnipro University of Technology

**14:00 - 14:10** «*Research of polimer composite material composition by means of FEA*» **BAHUZ Borys, FEDORIACHENKO Serhii**, Dnipro University of Technology



***NOVEMBER 27 2:00 PM – 4:00 PM – MASTER CLASS***

**STRUCTURAL CRITERIA OF  
STRENGTH AND CRACK  
RESISTANCE OF WELDED JOINTS  
BERDNIKOVA Olena**

[https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_NDkyNTgyNmItYjY4NC00ZWQ1LTgzMWItMmM4ZTk4NzMxNGQ1%40thread.v2/0?context=%7b%22Tid%22%3a%226cbb82a7-8f8b-4e21-8922-e8dd1f03e636%22%2c%22Oid%22%3a%22fcfcddf-6d37-4c63-a26b-5e111a1966cb%22%7d](https://teams.microsoft.com/l/meetup-join/19%3ameeting_NDkyNTgyNmItYjY4NC00ZWQ1LTgzMWItMmM4ZTk4NzMxNGQ1%40thread.v2/0?context=%7b%22Tid%22%3a%226cbb82a7-8f8b-4e21-8922-e8dd1f03e636%22%2c%22Oid%22%3a%22fcfcddf-6d37-4c63-a26b-5e111a1966cb%22%7d)

*Dear participants and guests of the 3rd International Scientific and Practical Conference "Development and Design of Modern Materials and Products"*

*We wish you fruitful work, pleasant online meetings and a successful conference!*

*Sincerely, the Conference  
Organizing Committee*