



## INTERNATIONAL CONFERENCE «BEAM TECHNOLOGIES IN WELDING AND MATERIALS PROCESSING»

In the period **from September 9 to 13, 2019**, IX International Conference «Beam Technologies in Welding and Materials Processing» (LTWMP-2019) was held in Odessa at «Arkadia» hotel. The Conference was organized by the E.O. Paton Electric Welding Institute of the NAS of Ukraine, NTUU «Igor Sikorsky Kyiv Polytechnic Institute» and International Association «Welding».

More than 60 scientists and specialists from Ukraine, Slovakia, Germany, Belarus and China took part in the Conference. It was organized in the form of plenary and poster sessions; conference working languages were Russian, Ukrainian and English (synchronous translation of the papers was provided). 37 presentations were made during the plenary and poster sessions.

The Conference was opened by Academician I.V. Krivtsun, Deputy Director of PWI, Chairman of Conference Program Committee. In his address he noted that papers on laser subjects, hybrid and 3D technologies were submitted for presentation at the conference, as well as papers on electron beam technologies in welding and special electrometallurgy. Academician I.V. Krivtsun also noted the role of the vapour-gas channel in beam technologies at forma-

tion of welded joints and role of the synergic effect in hybrid technologies.

Let us mention some of the papers which give an idea about the issues raised at the conference:

- «Features of formation of metal structure of products from titanium alloys, produced by 3D printing with application of profiled electron beam by xBeam 3D Metal Printing Technology», *Kovalchuk D.V.*, PJSC «NVO «Chervona Hvilya», Kyiv;
- «Contribution to the welding of hot-rolled aluminium-lithium alloys by electron beam», *Drimal Daniel*, PRVA ZVARACSKA a. s., Bratislava, Slovak Republic;
- «Specialized technological electron beam equipment for realization of additive process of layer-by-layer manufacturing of metal products with application of powdered materials», *Nesterenkov V.M.*, PWI, Kyiv;
- «Electron beam melting of high-temperature titanium alloys of Ti–Si–Al–Zn–Sn system», *Severin A.Yu.*, SC «SPC Titan» of PWI, Kyiv;
- «Optimization of technological parameters of layer-by-layer formation of products from VT6 titanium alloy using EBW based on mathematical modeling», *Kandala S.M.*, PWI, Kyiv;



Academician I.V. Krivtsun addressing the Conference at the opening



Participants of LTWMP-2019 Conference

- «Optimization of technological operations of laser welding and laser surfacing of elements of small-sized nozzle blocks of liquid rocket engines», *Shelyagin V.D.*, PWI, Kyiv;
- «Modeling of temperature fields in electron beam sintering», *Semenov O.*, PWI, Kyiv;
- «Electron beam technology as a method of producing thermal barrier coatings of  $ZrO_2-Y_2O_3$  system with good functional characteristics on different types of metal bond coats», *Kurenkova V.V.*, LLC «Paton Turbine Technologies», Kyiv;
- «Formation of consumable electrodes from sponge titanium by the method of electron beam surface melting», *Pikulin A.N.*, SPC «Titan» of PWI, Kyiv;
- «Microstructure of VT20 titanium alloys produced by the method of layer-by-layer electron beam surfacing with application of local powdered materials», *Matviichuk V.A.*, PWI, Kyiv;
- «Hybrid laser-microplasma welding of stainless steels», *Khaskin V.Yu.*, Chinese-Ukrainian Paton Institute of Welding, Guangzhou, PRC;
- «Adaptive control of the process of laser welding and surfacing of parts of a complex shape, while ensuring the geometrical accuracy of trajectory movements», *Kombarov V.V.*, SPC «KHAI-Engineering». Kharkiv;
- «Regularities of the effect of the parameters of selective laser melting (SLM) on formation of a single layer from high-temperature nickel alloy INCONEL 718», *Adzhamskyi S.V.*, LLC «Laser additive technologies of Ukraine», Dnipro;
- «Structure and properties of the joints of AA7056 T351 aluminium alloy, made by electron beam welding», *Berdnikova E.N.*, PWI, Kyiv;
- «Modeling of the stress-strain state of steam turbine blades from titanium alloy at reconditioning repair with application of electron beam surfacing», *Kandala S.M.*, PWI, Kyiv;
- «Investigations of laser-casting process of producing bimetals for different functional purposes», *Salii S.S.*, NTUU «Igor Sikorsky Kyiv Polytechnic Institute», Kyiv;
- «EBW and heat treatment of sparsely doped titanium alloys based on  $\beta$ -phase», *Belous V.Yu.*, PWI, Kyiv;
- «Elimination of humping effect in laser-arc welding of higher strength steels», *Khaskin V.Yu.*, Chinese-Ukrainian Paton Institute of Welding, Guangzhou, PRC;
- «Structure and properties of dissimilar titanium-aluminium welded joints, produced by laser welding», *Sidorets V.N.*, PWI, Kyiv;
- «Hybrid system for electron beam evaporation and ion sputtering», *Kuzmichev A.I.*, NTUU «Igor Sikorsky Kyiv Polytechnic Institute»;
- «Electron beam melting of sparsely doped titanium-based alloys», *Berezos V.A.*, SPC «Titan» of PWI, Kyiv;
- «Investigation of the features of the processes of welded joint formation in laser welding of steels and alloys in different positions», *Bernatskyi A.V.*, PWI, Kyiv;
- «Effect of condensed multilayer protective coatings on cyclic strength of VT-6 alloy», *Mikitchik A.V.*, International Center for Electron Beam Technologies of PWI, Kyiv;
- «Microstrengthening of the boundaries of deposited layers in items produced by electron beam surfacing», *Khokhlova Yu.A.*, PWI, Kyiv.

Presentations on laser application in medicine, for 3D printing of plastics and two presentations on application of non-beam concentrated heat sources were also made:

- «Effect of pulsed-arc welding modes on thermal cycles and geometrical parameters of welds and HAZ of welded joints made by high-alloyed welding consumables», Poznyakov V.D., *PWI*, Kyiv;

- «Melting temperature of metal nanoparticles in plasma», *Dragan G.S.*, SRI of Physics of I.I. Mechnikov Odessa National University.

Outside of conference program, *A.P. Mukhachev*, Director of the Center of Chemical Technologies of the Academy of Engineering Sciences (Kam'yanske) spoke about the directions of the Center activity on restoration of hafnium, zirconium, niobium and molybdenum production in electron beam remelting units in Ukraine.

*Polishko A.A.* (*PWI*) made a presentation about YPIC/WRTYS 2020 «Young Professionals International Conference on Welding and Related Technologies», May 19–22, 2020, Kyiv (<https://ypic2020.com>) and invited the scientists, specialists and business leaders to take part in it as presenters, listeners and sponsors. Representatives of a number of Ukrainian industrial enterprises from Kyiv, Dnipro, Zaporizhzhia, Kharkiv, Kryvyi Rih, Kam'yanske, using laser and beam technologies in the production cycle, also participated in the conference without making presentations.

The Conference was completed by a Round Table on «New developments in the field of 3D beam tech-

nologies». During the round table urgent problems of development of beam welding technologies were discussed in relation to manufacturing 3D products from various metallic materials, and finished products were demonstrated, which were manufactured by laser 3D prototyping (LLC «Laser Additive Technologies of Ukraine») and in electron beam units (PJSC «NVO «Chervona Hvilya», *PWI*).

Proceedings of LTWMP-2019 Conference will be published by the end of 2019. The Proceedings of the previous eight LTWMP Conferences can be ordered from «Avtomaticeskaya Svarka» Editorial Board or received in the public domain in *PWI* publishing house site at the following link: <http://patonpublishinghouse.com/eng/proceedings/ltwmp>.

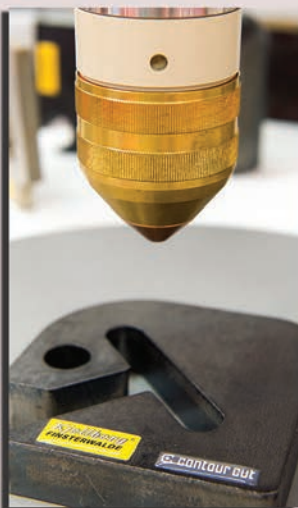
Friendly, hospitable and creative atmosphere of the Conference contributed to development of useful discussions, and establishing business contacts. Conference participants unanimously supported the proposal to conduct the following tenth International Conference on beam technologies in welding and materials processing (LTWMP-2021) in September 2021 in Odessa, Ukraine.

Organizing Committee of LTWMP-2019 Conference expresses gratitude and appreciation to PJSC «NVO «Chervona Hvilya», High Energy Technologies Companies, Chinese-Ukrainian Paton Institute of Welding, *PWI* «Titanium» Center, *PWI* Electron Beam Welding Center, and *PWI* International Center for Electron Beam Technologies for their assistance in conducting the Conference.

Dr. A.T. Zelnichenko

## CUTTING WORLD 2020

### THE TRADE FAIR FOR PROFESSIONAL CUTTING TECHNOLOGY



From April 28 to 30, 2020, Cutting World will be open at Messe Essen. It is the only trade fair to concentrate on the entire process chain on the subject of cutting. Numerous exhibitors have already taken the opportunity to secure booth areas in the new Hall 8 for themselves. Since recently, these have also included the following companies: Assfal, Boschert, Cam Concept, Eckelmann, Kjellberg, MGM, ProCom and Rosenberger. Air Liquide Deutschland, BKE, IHT Automation, NUM, STM Waterjet and Yamazaki Mazak Deutschland had previously confirmed their participation. Any interested exhibitors can find the registration documents at [www.cuttingworld.de](http://www.cuttingworld.de). The registration deadline will be November 30, 2019.