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and International Association for Technological Development and Innovations

# InterPartner

Grabchenko's International Conference  
on Advanced Manufacturing Processes **2022**

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**4th Grabchenko's International Conference  
on Advanced Manufacturing Processes  
September 6-9, 2022 | Odessa, Ukraine**

## ***Book of Abstracts***

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**4<sup>th</sup> Grabchenko's International Conference  
on Advanced Manufacturing Processes  
(InterPartner-2022)**

September 6-9, 2022 | Odessa, Ukraine

*Book of Abstracts*

Sumy  
2022

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**Advanced** Manufacturing Processes: Book of Abstracts of the 4<sup>th</sup> Grabchenko's International Conference on Advanced Manufacturing Processes, Odessa, Ukraine, September 6-9, 2022 / Volodymyr Tonkonogyi, Vitalii Ivanov, Ivan Pavlenko, Justyna Trojanowska (Eds.). – Sumy: IATDI, 2022. – 104 p.

*Recommended by Coordination Board of International Association for Technological Development and Innovations (Protocol No. 3, May 2, 2022)*

This book offers a timely snapshot of innovative research and developments at the interface between manufacturing, materials and mechanical engineering, and quality assurance. It covers various manufacturing processes, such as grinding, boring, milling, broaching, coatings, including additive manufacturing. It focuses on cutting, abrasive, stamping-drawing processes, shot peening, and complex treatment. It describes temperature distribution, twisting deformation, defect formation process, failure analysis, as well as the convective heat exchange and non-uniform nanocapillary fluid cooling, highlighting the growing role of quality control, integrated management systems, and economic efficiency evaluation. It also covers vibration damping, dynamic behavior, failure probability, and strength performance methods for aviation, heterogeneous, permeable porous, and other types of materials. Gathering the best papers presented at the 4th Grabchenko's International Conference on Advanced Manufacturing Processes (InterPartner-2022), held in Odessa, Ukraine, on September 6–9, 2022, this book offers a timely overview and extensive information on trends and technologies in manufacturing, mechanical, and materials engineering, and quality assurance. It is also intended to facilitate communication and collaboration between different groups working on similar topics and to offer a bridge between academic and industrial researchers.

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## Evaluation of a Decrease in Temperature Conditions Upon Intermittent Grinding

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The aim of the work is theoretical substantiation of the laws of cutting temperature formation during discontinuous grinding and conditions of its significant reduction to ensure high-productive and high-quality machine parts machining. It is established that with decreasing the length of the working shoulder of a discontinuous circle, the cutting temperature passes a minimum point, in which the lengths of the working shoulder and the hollow of the circle are equal. It is established that the lowest value of cutting temperature and the highest value of machining productivity is achieved at interrupted depth grinding with relatively low part speed and grinding width close to the circle height. Cutting temperature is lower, and machining productivity is higher than grinding with a full circle. We received the analytical dependence for determining the cutting temperature ratio at grinding by discontinuous and solid circles. It contains only one value: the number of contacts of working ledges of a discontinuous circle with a fixed section of a machined workpiece. The discrepancy between calculated and experimental values of the given cutting temperature ratio does not exceed 10 %. It indicates the reliability of the obtained theoretical solution. The results of the research are recommended to be used in the development of high-performance technological processes of interrupted grinding of machine parts.