

InterPartner

Grabchenko's International Conference
on Advanced Manufacturing Processes

**6th Grabchenko's International Conference
on Advanced Manufacturing Processes**
September 10-13, 2024 | Odesa, Ukraine



Book of Abstracts

International Association for Technological Development and Innovations

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Sumy
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Advanced Manufacturing Processes: Book of Abstracts of the 6th Grabchenko's International Conference on Advanced Manufacturing Processes, Odesa, Ukraine, September 10-13, 2024 / Volodymyr Tonkonogyi, Vitalii Ivanov (Eds.). – Sumy: IATDI, 2024. – 120 p.

Recommended by the Coordination Board of the International Association for Technological Development and Innovations (Protocol No. 5, February 1, 2024)

This book offers a timely snapshot of innovative research and developments at the interface between design, manufacturing, materials, mechanical and process engineering, and quality assurance. It covers various manufacturing processes, such as grinding, turning, drilling, milling, broaching, and gear machining, including additive manufacturing, strengthening, electro-mechanical processing, vacuum technology, and deforming broaching. It focuses on computer and numerical simulation, mathematical and reliability modeling, and machine learning models for manufacturing systems and processes. It describes innovative cutting and abrasive processes and combined technologies. It also investigates the electrical resistance, self-sharpening effect, strengthening, heat treatment, surface peening, and heat resistance of various coatings and materials. Gathering the best papers presented at the 6th Grabchenko's International Conference on Advanced Manufacturing Processes (InterPartner-2024), held in Odesa, Ukraine, on September 10–13, 2024, this book provides a comprehensive and up-to-date examination of design, manufacturing, mechanical, materials, and process engineering, as well as quality assurance trends and technologies. Yet, it also aims to foster international and interdisciplinary communication and collaborations, offering a bridge between the academic and industrial sectors.

Development and Substantiation of Proposals for Modernization of Plate Rolling Mill

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The modernization options for the heavy plate rolling mill of one of the Italian metallurgical enterprises are considered the necessity to expand the assortment of new sizes of hot-rolled plates steel grades with high mechanical properties and, of course, to produce high-quality products with reduced operating costs. The target parameters for the product mix of the plate rolling mill after modernization are the thickness range of 5.0–150.0 mm for steel grades up to S900MC according to EN 10149-2. This work compares the technical parameters of an actual rolling mill and two modernization options: option 1 is a two-high rolling mill with increased working roll diameters; option 2 is a four-high rolling mill. Both options consider that the weight of work rolls and backup rolls with chocks will not exceed the existing crane load capacity of 80 t. When comparing option 1 and option 2, option 2 is preferable because it enables the production of low-thickness products of reference steel grade S900MC with fewer passes and assures more engineering strain. Option 2 for the rolling mill parameters provides more yearly capacity with lower electricity consumption. The efficiency of using a rolling mill with option 2 parameters is 37.8% higher than option 1 and 62.1% higher than the available rolling mill. As a result of the comparison calculation, it is obvious that a more efficient layout conception is one with four high rolling mill parameters of option 2.

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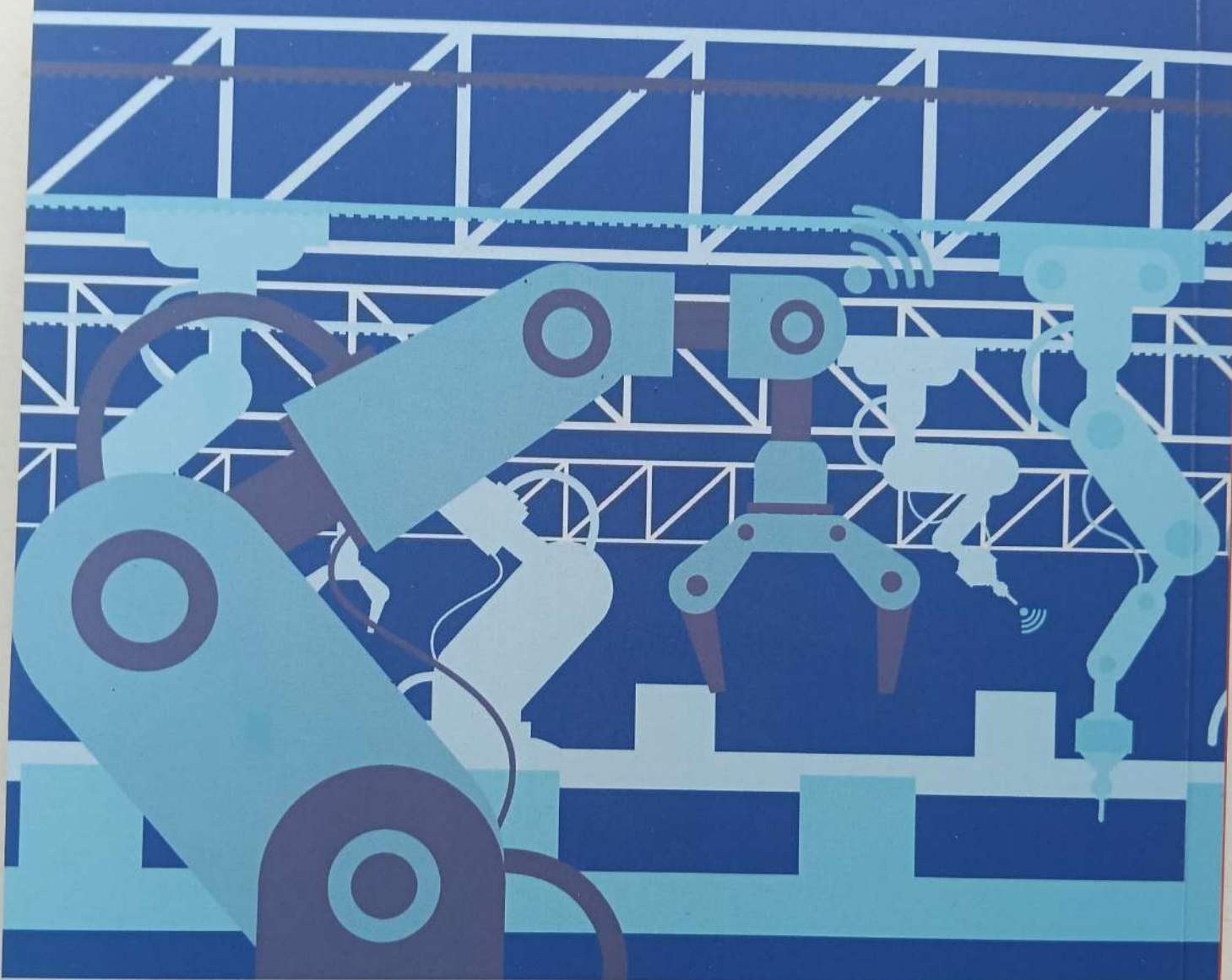
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