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Special Issue in High Temperature Materials and Processes: A DEEP DIVE INTO MACHINING AND WELDING ADVANCEMENTS: MATERIALS, MECHANICS, AND MICROSTRUCTURES

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DESCRIPTION

Machining and welding, generally regarded as high-temperature processes, are two main pillars of the industrial revolution. In most sectors namely aerospace, automobile, power plants, petrochemicals, and oil and gas, components are made individually, machined, and then joined together for their intended applications. However, traditional methods of machining and joining are now obsolete as these methods are not able to fulfill the market needs in terms of quality and productivity.

Another reason behind their obsoletion is the emergence of novel and advanced materials where these methods have compatibility issues with such materials. This led to the development of advanced machining and joining processes like water jet machining, laser beam machining, ultrasonic machining, EDM, wire EDM, advanced GMAW and GTAW, laser welding, ultrasonic welding, and many more. These advanced methods are not only compatible with novel and advanced materials but also meet the market demands in terms of quality and productivity. Also, these modern techniques are environmentally friendly as they consume less energy and release minimal waste as compared to traditional methods leading to sustainable growth for a sustainable society.

However, the combination of these advanced machining and joining processes with different novel materials is not well explored. Various aspects like surface quality, material removal rate, mechanical strength, heat treatment, grain refinement, microstructural evolutions, etc., need to be discussed. Also, these processes require optimization to obtain the best parametric values for a satisfactory output by applying modern decision-making tools and techniques.

In this regard, this special issue aims to explore the recent advancements in machining and joining processes and their applications to advanced and novel materials for sustainability. It embraces cutting-edge research and progressive concepts that contribute to the development and selection of advanced materials and methods. It seeks to address the multifaceted challenges and opportunities in the field of fabrication, selection, and decision-making for these advanced materials and methods and their sustainable behavior. By fostering cross-disciplinary discussions and pioneering research, this special issue attempts to uncover novel solutions to global challenges in terms of sustainability by addressing SDGs 9, 11, and 13.

KEY TOPICS

Submissions are encouraged in the following areas but not limited to:

- Advanced machining techniques
- Advanced joining techniques
- Novel and advanced materials for industrial applications
- Process, product, or material-based modeling and simulation
- Design, analysis, and fabrication of machined and welded structures
- Physical mechanism of modern machining and welding processes
- Characterization of bulk, surface or local features, properties, and phenomena
- Microstructure and Phase Evolution, Machinability, Weldability
- SEM, TEM, EBSD, XRD, GAM
- Machining and welding parameters and parametric optimization
- State-of-the-art scientific developments in welding metallurgy
- Automation, monitoring, and control of machining and welding operations
- Additive manufacturing, in situ alloying, surfacing, cladding, and cutting

HOW TO SUBMIT

Before submission authors should carefully read the Instruction for Authors. In order to make the preparation of manuscript easier, you are advised to use the Manuscript Template.

All submissions to the Special Issue must be made electronically via the Editorial Manager submission and tracking review system.

All manuscripts will undergo the standard peer-review process (single-blind, at least two independent reviewers). When entering your submission via online submission system please choose **"SpecialIssue_A Deep Dive into Machining and Welding Advancements"**.

The deadline for submissions is **20th August, 2024**, but individual papers will be reviewed and published online on an ongoing basis.

In case of any question please contact **Ms. Joanna Kosińska**, Managing Editor of High Temperature Materials and Processes, Joanna.Kosinska@degruyter.com