

Tentative Outline

Special/Thematic Issue for the Journal Current Materials Science

Advances and Constraints in Laser and Arc Cladding & Welding Technologies

Guest Editor: Dr. Mayuri Baruah
Co-Guest Editor: Dr. Kanwer Singh Arora

Scope of the Thematic Issue:

Welding is one of the applied techniques for joining of similar and dissimilar materials-laser and arc heat source being the most utilized one. However, joining of dissimilar materials pose great difficulties in terms of both physical and metallurgical effects. Proper optimization of the process is an absolute necessity. Cladding process is basically enveloping/coating an already existing structure to form new build without compromising its properties. While the process mayn't be suitable for applications where high strength and load bearing capacity is desirable, but Cladding does provide a protective layer basically for repair purpose or surface processing. Cladding has thus opened up a new perspective for surface engineered materials. In this context, application of suitable cladding that forms the metallurgical bond with the substrate, has huge potential to enhance the functionalities including wear and abrasion resistance, high-temperature corrosion and oxidation resistance, reduce frictional losses, improve biocompatibility, etc. In the recent times, there has been significant development in both the processing aspects of different cladding technologies including laser cladding, plasma transferred arc cladding, arc-based hard-facing as well as development of novel and superior feedstocks for enhanced performance of the critical components. The cladding technology has found its niche in various industries including mining and metals, oil and gas, nuclear and biomedical sectors can benefit from these developments. Laser Cladding is the most demanding amongst all such technologies due to its extensive advantages of being able to process almost all materials, small heat affected zone, less distortion and high precision.

The aim of this Special Issue is to highlight some of the most recent and most significant contributions to the Laser and Arc Welding and Cladding Technologies and related fields through submitting original research papers and reviews from leading personalities worldwide.

Keywords: Laser cladding, laser welding, optimization, mig welding, arc cladding, Artificial Intelligence in cladding.

Sub-topics:

- Laser cladding processing
- Plasma transferred arc cladding
- Flux cored arc cladding
- MIG and TIG cladding
- Micro plasma transferred arc and micro laser cladding
- High efficiency cladding
- High speed laser cladding
- Industry 4.0 in different cladding technologies
- Artificial Intelligence in cladding
- New Alloy developments (powders and wires) for cladding
- Failure analysis of cladding
- Numerical modelling and simulations of claddings
- Case studies on improved productivity through application of cladding
- Microstructure-property-performance correlations for claddings
- Claddings for high temperature and other extreme applications
- Economics of Cladding
- Mechanical & Corrossion properties Evaluation of the cladded samples

Schedule:

- Complete Thematic issue submission deadline: **March 31st 2024**

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