

## Tentative Outline

### Special Thematic Issue for the journal Current Material Science

**Title of the Thematic Issue: “Processing methods for developing advanced composite materials”**

**Guest Editors: Dr. R. Ranjith, Dr. J. Paulo Davim, Dr. Azuddin Bin Mamat**

#### • Scope of the Thematic Issue:

Metal matrix composites has found its application in aerospace, marine and defence sector owing to its high strength to weight ratio. Attaining uniform distribution of composites and mass production of the composites are the challenging tasks. Adding reinforcing particles at high weight proportion leads to the increment in void content. Machining of these composites induces high tool wear rate and surface roughness of the machined surface was not up to the industry expectation. Particular challenges in composites machining are connected with the creation of severe flaws, rapid tool wear progression, and limited tool life, resulting in a substantial number of component rejections. Experimental and theoretical study devoted to production of composites, examinations of cutting mechanisms, process parameter optimization, wear prediction and improving machining performance are critical to resolving fundamental technological challenges.

This thematic issue aims to report novel research in the field of production of metal matrix composites, tribological, mechanical and corrosion behavior of composites, conventional and unconventional machining of composites, process optimization techniques, artificial intelligence in wear and machining rate prediction. Full papers, communications, and reviews are all welcome.

**Keywords:** Metal Matrix composites, Production of composites, Composite machining, Artificial Intelligence, Surface topography, Optimization

#### Sub-topics:

The sub-topics to be covered within the issue should be provided:

- Production and characterization of composites
- Mechanical, Corrosion and tribological behavior of composites
- Stress corrosion and hydrogen induced cracking
- Worn, Machined and corroded surface morphology
- Mathematical modelling and corrosion prediction methodologies
- Unconventional and hybrid Machining of composites
- Electro chemical machining
- Artificial intelligence for the prediction of corrosion, wear and machining rate
- Composite coating via chemical vapor deposition, physical vapor deposition, etc.
- Optimization techniques.

#### Tentative titles of the articles:

- Investigation on mechanical and tribological properties of AA7075/Gr composites for solar header pipes
- Experimental and numerical analysis of diametric compression test of FRP rings
- Machining performance of Hastelloy under  $Al_2O_3$  mixed dielectric environment
- Fabrication of porous titanium using Selective laser melting additive manufacturing for orthopedic applications
- Wire additive manufacturing of magnesium alloy reinforced and coated with titanium alloy using cold metal transfer for connecting rod
- An evaluation of thermosetting penetration in additively produced powder-based composites
- Characterization of copper composites processed through friction stir processing route
- Microstructure and mechanical properties of AA6061/CNT aluminum matrix composites prepared by ultrasonic assisted stir casting technique, fahmidagulshan@mme.buet.ac.bd
- Production of affordable porous titanium-based composites using additive manufacturing for biomedical application, kamalakantam@gmail.com
- Ultrasonic assisted Micro-EDM for the machining of  $TiO_2$ -SiC-graphite composite for 3D micro-

cavities, raddotenkorang@yahoo.com

- Process parameter optimization of Al/SiC metal matrix composites during laser beam machining process
- Fabrication and Machining Methods of Composites for Aerospace Applications

#### **Schedule:**

- Thematic issue submission deadline: **31/01/2023**

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