

**PROCESSING METHODS FOR METAL MATRIX COMPOSITES PRODUCTION****N. Pagonis<sup>1\*</sup>, D. Flegkas<sup>1</sup>, A. Kyriazoglou<sup>2</sup>, A. Domopoulou<sup>3</sup>, C. Tsanaksidis<sup>1</sup>, V. Karayannis<sup>1</sup>**<sup>1</sup>Department of Chemical Engineering, University of Western Macedonia, Greece<sup>2</sup>Department of Mechanical Engineering, University of Western Macedonia, Greece<sup>3</sup>Department of Product & Systems Design Engineering, University of Western Macedonia, Greece\*[chemeng00160@uowm.gr](mailto:chemeng00160@uowm.gr)**ABSTRACT**

In the present study, an extensive analysis is performed on the processes for the production of metal matrix composite materials (MMCs). In addition, some examples of synthesis and use of specific MMCs are given, for a better and easier understanding of the techniques. Prior to the detailed study of the production techniques, an introduction is made to both the composites in a general context and to the composites of metal matrices in particular <sup>[1]</sup>. This introduction is accompanied by a brief historical review of the composite materials, their uses and the ways of their synthesis today <sup>[2]</sup>. Finally, the outcomes of the study are presented, the course of the MMCs is discussed and a comparison of each process strengths and weaknesses is undertaken.

The methods that are investigated in this study consist of two main categories: i) solid state and ii) liquid phase processes, depending on the physical state of the matrix material during processing. Specifically, in liquid phase processes, the matrix is in a liquid or semi-solid state, while in those of the solid phase, the matrix is strictly in a solid state. In solid state processes, powder metallurgy, diffusion consolidation and vapor deposition techniques are included. As for liquid phase processes, the main techniques are stir casting, infiltration, spraying, electroplating, electroforming and autocatalytic techniques (in-situ processes) <sup>[3-5]</sup>.

**KEYWORDS:** Metal matrix composite (MMC), production process, solid state, liquid phase**REFERENCES**

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