

Design and Optimization of Mg – B₄C Formed Metal Matrix Composite

Vivek Shinde¹, Devashish Dakulge², Sahil Chaudhari³, Dr. J. A. Hole⁴, Ashish khodve⁵

Department of Mechanical Engineering^{1,2,3,5}

Faculty of Mechanical Engineering⁴

JSPM's Rajarshi Shahu College of Engineering, Tathwade, Pune, Maharashtra, India

Abstract: *The study focuses on developing new metal matrix composite (MMC) using magnesium as the base metal, boron carbide (B₄C) as the reinforcement particle, and vinyl ester resin as the binder. This MMC aims to achieve enhanced mechanical properties, including a higher strength-to-weight ratio, improved corrosion resistance, and increased hardness, making it suitable for automotive and aerospace applications. The fabrication process is simulated using advanced computer-aided design software, which allows for precise structural representation, as well as analysis of stress-strain, heat, and deformation. Analytical computations are used to validate the simulation results.*

Keywords: Magnesium, Boron Carbide (B₄C), Vinyl Ester Resin, Metal Matrix Composite (MMC), Mechanical Properties, Simulation Results

