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Design and Optimization of Mg – B4C Formed Metal Matrix Composite

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Abstract: The study focuses on developing new metal matrix composite (MMC) using magnesium as the base metal, boron carbide (B_4C) 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

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