# Review of: "The Influence of Hot Extrusion on The Mechanical and Wear Properties of an Al6063 Metal Matrix Composite Reinforced With Silicon Carbide Particulates"

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Potential competing interests: No potential competing interests to declare.

The article provides a comprehensive and insightful study of the mechanical and wear behavior of Al6063 alloy reinforced with different weight fractions of silicon carbide under both 'as-cast' and 'hot extruded' conditions. The research investigates the influence of SiC reinforcement on various properties, including density, porosity, tensile strength, compression strength, hardness, impact strength, and adhesive wear resistance. The study utilizes the stir casting technique for composite fabrication, with a subsequent hot extrusion process, and employs a range of testing methods to evaluate the performance of the developed composites.

The introduction sets the stage effectively, outlining the significance of lightweight composite materials, the popularity of aluminum alloys in various industries, and the rationale behind reinforcing aluminum with ceramic particles. The literature review provides a solid foundation, citing relevant studies and the methodologies adopted by other researchers. This contextualization enhances the credibility of the current research.

The experimental work section is detailed and well-organized, describing the fabrication process, material testing standards, and the rationale behind using stir casting and hot extrusion techniques. The inclusion of specific details such as temperature, stirring speed, and extrusion parameters adds transparency to the experimental procedures. Furthermore, the use of recognized standards for mechanical and wear testing enhances the reliability of the results.

The results and discussion section is thorough and effectively presents the findings in a systematic manner. The density and porosity graphs clearly illustrate the impact of SiC reinforcement and hot extrusion on the composite's physical properties. Tensile and compression test results provide valuable insights into the mechanical strength of the composites, and the graphs are well-labeled and easy to interpret. The impact of SiC reinforcement on hardness and the subsequent effect on impact strength is discussed in detail. The wear tests, presented through graphs and micrographs, offer a comprehensive analysis of the tribological performance of the composites under different conditions and loads.

The conclusion succinctly summarizes the key findings, emphasizing the improvement in mechanical properties and wear resistance with the addition of SiC reinforcement. The reduction in porosity and the refinement of grains in hot extruded composites are noteworthy observations. The implications of the research for practical applications are discussed, and the conclusion effectively wraps up the article.

Overall, the article is well-written, scientifically rigorous, and provides valuable contributions to the field of lightweight

composite materials. The inclusion of detailed experimental procedures, comprehensive results, and insightful discussions makes a compelling case for the publication of this research article. I recommend accepting this article for publication after minor revisions, such as

1. **Lack of Comparative Studies:** While the article provides a thorough analysis of the developed composites, it could benefit from a more extensive comparison with existing studies on similar materials or processing techniques. This would strengthen the article's contribution to the field.
2. **Limited Discussion on Drawbacks:** The article does not extensively discuss potential drawbacks or limitations of the study, such as the cost-effectiveness of the fabrication process, scalability for mass production, or challenges associated with the chosen reinforcement.
3. **Further Exploration of Wear Mechanisms:** Although the article touches upon wear mechanisms, a more in-depth exploration of the underlying mechanisms, especially in the context of hot extrusion, would enhance the overall understanding of the material's behavior.

Considering these factors, ***I am pleased to recommend this article for further consideration and publication in the journal.***