

Review of: "Investigating the Mechanical and Tribological Effects of MoS₂ Reinforcement in AZ91 Magnesium Alloy: A Comprehensive Experimental Study"

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Potential competing interests: No potential competing interests to declare.

The study addresses a significant area of research in materials science, particularly relevant to the transportation industry's need for lightweight, strong materials. The use of a hole technique in FSP, as opposed to the more common groove method, is innovative and could provide new insights. The methodology is well-detailed, allowing for the reproducibility of the experiment. The study clearly states its objectives and the parameters being investigated. The inclusion of surface microstructure analysis and tensile strength testing provides a thorough evaluation of the FSP-treated areas.

However, there are certain areas where it requires the attention of the authors.

Minor

1. Provide more detail on why the hole technique was chosen over the groove method and what specific advantages it offers.
2. Explain the rationale behind selecting specific processing parameters like the rotation speed, travel speed, and load.
3. Include a comparison of the results obtained with the hole technique against those obtained with the groove method in the literature to highlight the advantages or differences more clearly.
4. Ensure the microstructure images are clear and well-labeled, with scales provided for better understanding.
5. Address any limitations or challenges encountered during the study and how they were mitigated.
6. How was the uniformity of MoS₂ particle distribution ensured in the drilled holes, and how might this affect the results?
7. Can you elaborate on how different rotational and travel speeds impact the microstructure and mechanical properties of the composite?
8. Was any statistical analysis performed to validate the significance of the differences in tensile strength and hardness among samples processed at different speeds?