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REVIEWER'S REPORT

Manuscript No.: IJAR-51967 Date: 30-05-2025

Title: INVESTIGATION OF THE AERODYNAMIC CHARACTERISTIC OF SOLAR POWERED LAWN MOWER BLADES

Recommendation:
Accept as it is……**YES……**
Accept after minor revision……
Accept after major revision ……
Do not accept (*Reasons below*) ……

Rating	Excel.	Good	Fair	Poor
Originality	√			
Techn. Quality		√		
Clarity		√		
Significance			√	

Reviewer's Name: Mr Bilal Mir

Reviewer's Decision about Paper: **Recommended for Publication.**

Comments (*Use additional pages, if required*)
.

Reviewer's Comment / Report

Abstract & Manuscript Overview:

The manuscript presents a research-based investigation into the aerodynamic performance of solar-powered lawn mower blades. It focuses on addressing environmental concerns caused by gasoline mowers by enhancing the efficiency of solar alternatives. The study incorporates computational fluid dynamics (CFD), stress analysis, and an aerodynamic evaluation based on the NACA5616 airfoil profile. The abstract provides a comprehensive outline of the objectives, methodology, and key findings, emphasizing the aerodynamic properties and lift-drag performance metrics of the blades.

Originality and Relevance:

The topic is original and relevant, especially in the context of growing environmental

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consciousness and the need for sustainable technology. The integration of aerodynamics into lawn mower blade design and the emphasis on solar energy usage are timely and significant areas of inquiry.

Technical Content and Scientific Merit:
The manuscript demonstrates a solid understanding of aerodynamic principles, especially through its use of CFD tools and lift-drag coefficient analysis. The study also includes a stress analysis of blade materials, highlighting the mechanical considerations essential to operational performance. The inclusion of velocity contour analysis at multiple angles adds depth to the investigation. The research is data-driven, and the mention of statistical significance in the findings adds scientific credibility.

Clarity and Organization:
The manuscript is structured logically, beginning with an abstract that succinctly captures the essence of the study, followed by an introduction that contextualizes the research. The flow of information is coherent, and the narrative effectively transitions between historical background, literature reference, and contemporary technical investigation. Key terms and parameters such as CL, Cd, and effective field capacity are well defined.

Literature Integration:
Relevant prior works are cited to situate the current study within the existing body of knowledge. References to historical developments and modern advancements in mowing technology are appropriately acknowledged, supporting the manuscript's rationale.

Figures and Data Presentation:
While figures and numerical data are not provided in the reviewed content, the text references the inclusion of CL and Cd graphs and velocity contours, indicating an intent to support findings visually. These components are crucial for substantiating aerodynamic analyses.

Language and Style:
The manuscript uses formal, academic language consistent with scientific writing. Terminologies specific to mechanical and environmental engineering are employed accurately. The tone remains objective and focused on the research goals.

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Recommendation: The manuscript demonstrates a high level of academic rigor and relevance in the area of sustainable engineering solutions. It successfully merges mechanical, environmental, and computational perspectives to explore the effectiveness of solar-powered lawn mower blade designs.