

Review Form 3

Journal Name:	Advances in Research
Manuscript Number:	Ms_AIR_128927
Title of the Manuscript:	Study on process parameter optimization and strength failure mode of 3D printing board structure lattice material
Type of the Article	Opinion Article

General guidelines for the Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guidelines for the Peer Review process, reviewers are requested to visit this link:

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PART 1: Comments

	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.	This study focuses on investigating the mechanical properties of porous structures with triply periodic minimal surfaces (TPMS) fabricated through 3D printing. The methodology used in this study is essential for ensuring the reliability and significance of the findings.	
Is the title of the article suitable? (If not please suggest an alternative title)	yes	
Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.	The abstract clearly and concisely presents the study's objectives, methodology, and main conclusions. All essential elements of the study are mentioned, such as the materials used, fabrication techniques, types of tests conducted, and the results obtained. The abstract could be improved by adding numerical values to better illustrate the results. For example, it could specify the percentage increase in tensile strength of the D structure compared to the other structures. The obtained results could be contextualized by comparing them with findings from similar studies in the literature. This would facilitate a better understanding of the original contribution of this study.	
Is the manuscript scientifically, correct? Please write here.	This study provides a comprehensive overview of the mechanical properties of TPMS structures fabricated using FDM 3D printing with PLA. The obtained results can be valuable for researchers and engineers working with plastics and 3D printing technologies.	
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.	Could be improved	

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<p>Is the language/English quality of the article suitable for scholarly communications?</p>	<p>Minor editing of English language required</p>	
<p>Optional/General comments</p>	<p>The study you provided is about using 3D printing technology to create porous structures with a specific triply periodic minimal surface (TPMS) for lightweight applications. Here is a summary of the key findings:</p> <ol style="list-style-type: none"> 1. Material and Printing Method: Polylactic acid (PLA) was chosen as the 3D printing filament due to its good printability, stiffness, strength, biodegradability, and safety. Blender software was used to design the TPMS models (FRD, N, and D) because of its ability to handle complex geometric forms. FDM 3D printing technology was used to create the TPMS models based on the established parameters. 2. Analysis: The study aimed to analyze the mechanical properties of the 3D printed TPMS models, including tensile and compressive characteristics. Finite element analysis was conducted using Abaqus simulation software to compare the experimental results with the theoretical models. The results are expected to show that the D-type structure has the best tensile and compressive properties among the three TPMS models tested. 3. Data Analysis Stress-strain curves: Graphical representation of the results in the form of stress-strain curves is an effective method to visualize material behavior and identify significant inflection points. Comparison of results: The results obtained for the different TPMS structures were compared to identify differences in tensile and compressive strength. 4. Potential Improvements <ol style="list-style-type: none"> a) Increasing the number of replicates: To enhance the accuracy of the results and minimize the impact of experimental errors, it would be advisable to conduct a larger number of replicates for each type of structure. b) Stricter control of variables: It is crucial to precisely control all factors that could influence the results, such as humidity, temperature, and cooling rate. c) Detailed statistical analysis: A thorough statistical analysis would allow for a more confident identification of significant differences between the various structures. d) More complex modeling: The numerical models could be refined by considering more complex effects, such as material heterogeneity and nonlinear behavior. 5. A series of questions to which the authors ought to provide answers: What was the rationale behind selecting the three specific types of TPMS structures? How the 3D models of the TPMS structures were generated using Blender software? What type of finite elements were used in the numerical simulations? Were any defects or inhomogeneities observed in the printed material structure? 	

PART 2:

	<p>Reviewer's comment</p>	<p>Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</p>
<p>Are there ethical issues in this manuscript?</p>	<p><i>(If yes, Kindly please write down the ethical issues here in details)</i></p>	

Reviewer Details:

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