

Dear editor and reviewers:

Thank you for your constructive feedback. Please find below our reply to your requests which are **blue coloured** in the revised version of the manuscript.

Editor's comments:

- Please move Section 2. Materials and methods to the next page (keep with the immediate paragraph below).

Done

- Do the same for Section 3.

Done

- Please ensure that a figure and its caption are on the same page

Done. Figures and captions have been reformatted to remain on the same page throughout the manuscript.

- The reference list lacks proper formatting Please see examples on the template. For instance, the first reference will look like as follows when formatted properly. [1] Garcia-Granada A A. 2024High-compression crash simulations and tests of PLA cubes fabricated using additive manufacturing FDM with a scaling strategy. Comput. 12(3). 40 Note: journal names are abbreviated in italic, volume number is in bold. doi is optional.

Done. The reference style has been changed from Vancouver to IEEE format, and all citations now use the required square-bracket notation.

Reviewer #1

- Use square brackets for numbered citations, for example [1], and apply the required publication style consistently.

Done. The reference style has been changed from Vancouver to IEEE format, and all citations now use the required square-bracket notation.

- Remove parentheses around units in running text, for example 1.24 g/cm³ and 2580 ± 220 MPa. Apply consistent spacing between values and units.

Done.

- Page 3 Section 2.1: State explicitly which tensile strength applies to X and Y and which applies to Z. Define these axes relative to the build plane and build direction.

Done. Figure 1 has been revised to include a labelled coordinate system indicating the build direction (z-axis) and specimen orientation.

- Page 3 Section 2.1: Present the force estimate as a properly typeset equation with quantities and units, rather than 35(3030)=31500 (N).

Done. New Equation (1) has been reformatted using standard mathematical notation with variables, units and equation numbering consistent with the journal style.

- Page 3 Section 2.1: Replace the narrative list with a table of infill settings, unit cell sizes and cell counts for both specimen sizes.

Thank you for this recommendation. We have added a clarifying paragraph and a new table summarising the infill settings, unit-cell sizes and number of unit cells used for each specimen configuration.

- Pages 3–4 Figure 1 : The red marks do not clearly indicate the build direction. Use labelled arrows or appropriate in-plane or out-of-plane symbols, and identify the loading direction.

Done. Figure 1 now includes labelled axes and a clear indication of both build direction and compression loading direction.

- Page 4 Equation 2 : Verify the source. Reference [8] defines relative density using material volume fraction and adjusts porosity numerically; it does not provide the proposed expression. Supply an appropriate reference or derivation.

Thank you for identifying this issue. The citation has been corrected and additional references have been included to support the proposed relationship and its use in the literature.

- Page 5 Table 1 : Define the stress and displacement ratios, their reference quantities, and all other variables immediately when introduced.

Thank you for this useful comment. We have clarified that the hollow-cube examples are included solely as a simplified theoretical demonstration of the nonlinear relationship between relative density, cross-sectional area and mechanical response.

- Page 5 Figure 3 : Increase legend and label sizes. Remove unnecessary embedded software text and move explanatory information into the caption. Retain essential dimensions and readable physical quantities.

Figure 3 has been revised to improve clarity. The images are now presented at the same scale and the relationship between cross-sectional area and stress distribution is illustrated more clearly.

-Page 6 equations : Replace asterisks with conventional mathematical notation, using juxtaposition.

Done

-Page 8 Figure 7 : Use one symbol for relative density throughout the equations, axes, legends and captions. Define it explicitly. Use concise specimen identifiers or infill percentages in the legend. Put the normalisation definition in the axis label and caption instead of repeating “Stress/ d^n ” and units for every curve.

Thank you for your recommendation. The legend has been simplified and the notation for relative density has been made consistent throughout the figure, caption and manuscript.

- The panel described as the original stress–strain response should be labelled with unnormalised stress. Check both the plotted data and axis labels so the original panel is not presented as divided by relative density.

The figures have been revised to clearly distinguish original stress from normalised stress. Axis labels, legends and captions have been updated accordingly

- Page 8 Figure 8 : Apply the same legend simplification to the energy curves and explain the normalisation in the caption.

Thank you for your recommendation. We have changed the legend of figure.

- Page 8 Figure 8 caption : Use n consistently if the energy exponent is the same as the stress exponent. If different symbols are intended, define them and explain why both have the value 1.94.

Thank you for your recommendation. We have changed the legend of figure. We have changed n to m to be consistent with the power fit coefficient used in this research. The exponent obtained for energy is identical to that obtained for stress because the stored energy is calculated as the integral of the stress–strain curve. To avoid confusion, the symbol m is now used for the energy relationship while maintaining the same numerical value.

- Please clarify how the stress ratios in Table 1 were obtained. Under equal applied force, using average stress calculated as force divided by material cross-sectional area, row B gives $1/0.840=1.1905$, rather than 1.12. If the values come from finite-element analysis or different loading conditions, please define the reported stress measure and describe the calculation and boundary conditions.

Thank you for this comment. We have included a sentence to clarify that stress is obtained from simulation. The reported stress values are obtained from finite element simulations rather than from a simple force-to-area calculation. We have clarified this point in the manuscript and added additional Figure 3 illustrations to show the stress distribution and explain the observed differences

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- Pages 3–10 | Number equations and tables sequentially: Equation (3) is repeated and two tables are labelled Table 2.

We have checked numbering of equations, tables and figures. Thank you for bringing up this issue.

Reviewer #2 1.

1. Please add visible page numbers.

Thank you for your suggestion. Page numbers have not been added because the manuscript follows the official conference template requirements, which explicitly state that page numbers should not appear in submitted papers.

2. Equation (3) is assigned for several different questions.

We have checked numbering of equations, tables and figures. Thank you for bringing up this issue.

3. Two different tables labelled “Table 2”

We have checked numbering of equations, tables and figures. Thank you for bringing up this issue.

4. The reference energy is reported as 320 J in the methodology and results but 302 J in the conclusions. Please verify the correct value.

Thank you for identifying this typographical error. The conclusions section has been corrected to report the consistent value of 320 J (for 62% compression), which is also used in the temperature-rise calculations presented in Equation (7) and Table 3

5. Under Materials & methods section, clarify the number of independent specimens tested at each relative density (state clear experimental replication or statistical analysis).

Thank you for your comment. We have added a statement in Section 2.2 indicating that three independent specimens were tested for each configuration. Additional discussion regarding the observed experimental variability has also been included.

6. Under section 3, The derivation of $n=1.94$ needs mathematical and statistical justification. The objective function, density range, weighting method, uncertainty and validation procedure are not described. These details are important because the proposed exponent represents one of the main outcomes of the study.

Thank you for this comment. Additional information has been provided regarding the regression procedure used to determine the exponent. The power-law fit was performed using experimental relative-density data and the corresponding stress values. The resulting coefficient was stable when fitting either all nine density levels or only the higher-density subset, yielding exponents of 1.6744 and 1.9399, respectively. Current version of manuscript is not showing regression using only low densities to avoid confusion for the reader.