

Peer Review

Review of: "A Review on the Mechanical, Thermomechanical Properties and Crystallinity Aspects of 3D-Printed Nanocomposites Used for Fabricating Electronic/Structural Parts"

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Editorial Review & Publication Recommendation

Overall Recommendation: MAJOR REVISION (Not suitable for publication in current form)

The manuscript presents a large compilation of mechanical, thermomechanical, and crystallinity data for 3D-printed thermoplastic nanocomposites. The topic is relevant, the literature coverage is fairly strong, and the tables are useful for researchers working on AM-enabled polymer nanocomposites.

However, despite the strengths, the paper is **not yet ready for publication**. It reads more like a **well-organized data compilation** rather than a **critical scientific review**, and several essential elements required for journal acceptance are missing.

Below is a detailed evaluation.

Strengths

✓ 1. Good coverage of recent literature

The review collects data from a wide range of studies (PLA, ABS, PA, PC, PEEK, TPU, etc.), with updated references from 2018–2023.

✓ 2. *Useful consolidated tables*

Tables 2A–2E provide comparative mechanical performance, filler effects, and crystallinity insights. These will be valuable to readers.

✓ 3. *Clear explanation of how nanofillers influence properties*

Sections discussing crystallinity, chain mobility restriction, and interfacial adhesion are articulate and scientifically accurate.

✓ 4. *Structured and readable*

The manuscript is well-formatted and easy to follow.

Major Weaknesses (Need correction before publication)

✗ 1. *The manuscript lacks critical analysis*

Most of the content is descriptive (what each paper reported), but a high-quality review requires:

identifying contradictions in the literature

synthesizing trends

highlighting gaps

explaining mechanisms more deeply

comparing different researchers' approaches

Right now, the manuscript reports data **without strong interpretation**.

✗ 2. *Scope feels narrow for a full review article*

The manuscript focuses almost entirely on:

tensile/flexural/impact properties

crystallinity changes

DMA behavior

But important topics expected in a review of 3D-printed nanocomposites are missing:

print parameter interactions with nanofillers

anisotropy effects in AM
rheology and printability behavior
interlayer bonding mechanisms
processing–structure–property relationships
failure mechanisms
long-term stability or environmental performance

Without these, the review feels incomplete.

✗ 3. Heavy reliance on long tables rather than narrative insight

Large tables dominate the manuscript. Journals generally prefer:

synthesized commentary,
graphical trends,
conceptual diagrams,
summarized insights.

Tables alone do not satisfy review expectations.

✗ 4. Limited novelty/originality

The manuscript summarizes existing results but does not offer:

new classifications
new frameworks
new conceptual models
future research directions (beyond 4 very short points)

This reduces the scientific impact.

✗ 5. English language quality requires improvement

While generally understandable, the text contains:

repetitive sentences
occasional grammatical issues

inconsistent citation formatting

inconsistent abbreviations

A language polish is needed.

✗ 6. No discussion on limitations of the cited studies

A robust review should discuss:

limitations in sample preparation

variability in ASTM standards used

influence of infill patterns, raster angles

challenges in nanoparticle dispersion

issues with comparing data from different printers and materials

The manuscript currently reports data uncritically.

Minor Issues

Figures (like Figure 1–3) need clearer captions.

Some results are repeated in the text and tables.

The introduction can be made more concise.

A graphical abstract would enhance clarity.

Add a summary table of “Key findings and design guidelines.”

Final Recommendation

! Decision: MAJOR REVISION REQUIRED BEFORE PUBLICATION

The manuscript has potential but needs substantial improvement to meet publication standards.

Declarations

Potential competing interests: No potential competing interests to declare.