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REVIEWER'S REPORT

Manuscript No.: **IJAR-52857** Date: 17.07.2025

Title: USE OF POLYETHYLENE TEREPHTHALATE (PET) PLASTIC WASTE IN MORTAR

Recommendation:
Accept after minor revision.....

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

Reviewer Name:Dr.K.Arumuganainar **Date: 17.07.2025**

Reviewer's Comment for Publication.

This study shows that using PET plastic waste fibers as a partial replacement for sand in mortar is a promising way to recycle plastic and reduce environmental impact. Adding PET slightly changes the density of fresh mortar and increases water absorption, but it also improves compressive strength when used at 1% to 2% levels. Although flexural strength may decrease slightly, the overall mechanical performance remains acceptable. With proper mix design, PET fiber can be used to make more sustainable and eco-friendly building materials.

Detailed Reviewer's Report

Review Report

1. Title of the Paper

Use of Polyethylene Terephthalate (PET) Plastic Waste in Mortar
 Clear, concise, and relevant to the study's core topic.

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2. Abstract

 Strengths:

- Provides a good overview of the environmental issue (plastic waste) and the solution proposed (PET in mortar).
- States methodology (replacement of sand with PET, variation in cement content and W/C ratio).
- Includes main findings: stability in density, increase in compressive strength at certain PET levels, and implications for sustainability.

 Weaknesses:

- Lacks numerical results and statistical details.
- No mention of potential limitations or future work.

 Suggestion: Include at least one or two key numerical values (e.g., max compressive strength improvement %) to make the abstract more impactful.

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3. Introduction

 Strengths:

- Establishes the global issue of plastic waste, especially post-COVID.
- Well-supported with references and previous studies.
- Sets a strong rationale for choosing PET fibers.

 Weaknesses:

- Slightly repetitive in referencing types of plastic and their use in concrete/mortar.
- Could be more focused on research gaps.

 Suggestion: Briefly state the novelty of the study (e.g., unique mix design matrix or comparative analysis) early in the introduction.

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4. Materials and Methods

 Strengths:

- Materials and mix proportions are clearly described.
- PET fiber characterization is thorough (density, size).
- Adheres to relevant testing standards (NF EN 196-1, NF P 18-560).
- Wide range of cement dosages and PET contents increases reliability.

 Weaknesses:

- Manual cutting of PET fibers could introduce variability.
- No mention of statistical methods or replication count.

 Suggestion: Provide details on the number of specimens per test group and any statistical averaging techniques used.

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5. Experimental Results & Analysis

a. Fresh Mortar Density

 Findings: Density increased with cement content and was relatively stable with PET addition.
 Comment: Well-documented with figures. No significant drawback noted.

b. Water Absorption

 Findings: PET increased water absorption, especially >1.5%.

 Concern: High absorption may impact durability.

 Suggestion: Recommend mitigation techniques like water-reducing agents.

c. Flexural Strength

 Findings: PET at 1–1.5% showed comparable or improved strength in some cases.

 Concern: Flexural strength generally lower than control beyond 1.5%.

 Suggestion: Discuss possible fiber bonding issues causing this decline.

d. Compressive Strength

 Findings: 1.5–2% PET content led to improved compressive strength.

 Comment: Strongest section, well-analyzed, consistent with cited literature.

 Data Presentation:

- Figures are abundant, well-labeled, and supportive of the text.
- Trends across W/C ratios and cement dosages are clearly illustrated.
- Tables for raw values would have been helpful.

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6. Discussion

 Strengths:

- Links performance trends to material behavior (e.g., PET hydrophobicity).
- Acknowledges the trade-off between strength and porosity.

 Weaknesses:

- Limited comparison with other fiber types or commercial products.
- No durability testing (e.g., freeze-thaw, carbonation, etc.).

 Suggestion: Include discussion on long-term performance and scalability.

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7. Conclusion

 Strengths:

- Summarizes key takeaways effectively.
- Reiterates the value of PET reuse for sustainability.

 Weaknesses:

- Vague on specific mix recommendations (e.g., optimal PET% + W/C).
- No mention of cost or practical implementation.

 Suggestion: Add practical guidance for industry or suggestions for future studies.

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8. References

 Strengths:

- 20+ references; recent and relevant literature cited.
- Good mix of experimental and review sources.

 Suggestion: Ensure consistency in formatting (e.g., spacing, punctuation).

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9. Overall Contribution & Novelty

 Positive Aspects:

- Addresses a relevant global environmental issue.
- Offers an accessible method for PET reuse in civil engineering.
- Broad experimental matrix (PET%, cement content, W/C ratio) adds value.

 Limitations:

- Lacks long-term durability testing.
- Manual PET cutting method might limit reproducibility.
- No cost or lifecycle analysis.

Final Evaluation:

Criteria	Rating (out of 5)
Originality & Novelty	4.0
Technical Soundness	4.5
Methodology Clarity	4.0
Data Presentation	4.5
Practical Relevance	4.0
Language & Readability	4.0
Scope for Improvement	4.5

Overall Verdict: Recommended with Minor Revisions