

Review of: "Shear performance of polypropylene fiber reinforced high-strength self-compacting concrete beams"

Omid Sam-Daliri¹

¹ National University of Ireland, Galway

Potential competing interests: No potential competing interests to declare.

This study provides valuable insights into the shear performance of high-strength self-compacting concrete reinforced with polypropylene fibres. Addressing the below major comments will improve the quality of the paper.

1. The abstract does not clearly explain the specific objectives and hypotheses of the study. Please provide a more concise and structured summary of the research questions, methods, and key findings in the abstract.
2. The introduction is too short. It would be helpful to explicitly state the research gap that this study aims to address concerning the shear performance of high-strength self-compacting concrete reinforced with polypropylene fibres. For more information about thermoplastic materials, read and add some references, for example:

[a] McNiffe, E., Ritter, T., ... (2023). Advancements in functionally graded polyether ether ketone components: Design, manufacturing, and characterisation using a modified 3D printer. *Polymers*, 15(14), 2992.

[b] Ritter, T., McNiffe, E., Higgins, ... Design and modification of a material extrusion 3D printer to manufacture functional gradient PEEK components. *Polymers*, 15(18), 3825.

[c] Naguib, H. M., Zaki, E. G., Abdelsattar, D. E., Dhmees, A. S., Azab, M. A., Elsaeed, S. M., & Kandil, U. F. (2023). Environmentally Friendly Polymer Concrete: Polymer Treatment, Processing, and Investigating Carbon Footprint with Climate Change. *ACS omega*, 8(9), 8804-8814.

1. The paper provides detailed information about the materials and mix proportions, which is commendable. However, consider providing more context on why specific materials and proportions were chosen, especially regarding the use of limestone powder and the rationale for selecting the four volume percentages of polypropylene fibres.
2. It would be helpful to show a schematic of the material preparation procedure and experimental setup.
3. Provide more details about the rationale behind selecting the dimensions and reinforcement specifications for the beams. Explain why these specific parameters were chosen.
4. Discuss the potential influence of the use of plasticiser on the results, particularly in terms of shear strength.
5. More in-depth discussions are needed for the results. Explain the implications of the variations in passing ability, viscosity, filling ability, and the observed compressive and tensile strength changes in relation to the addition of polypropylene fibers.
6. The conclusion mentions a decrease in compressive strength and an increase in splitting tensile strength but lacks a thorough discussion of the potential reasons behind these trends.

7. Provide insights into the significance of the crack patterns observed in Figures 9 and 10. How do these patterns relate to the shear performance of the beams?
8. Consider adding recommendations for future research directions based on the outcomes of this study.