Review of: "The Effects of Polypropylene Wastes on the Compressive Strength of Grade 25 Concrete"

Mainak Ghosal[1]

1 Indian Institute of Engineering Science and Technology, Shibpur

Potential competing interests: No potential competing interests to declare.

Here is a technical review of the article "The Effects of Polypropylene Wastes on the Compressive Strength of Grade 25 Concrete" for academic interests:

Strengths:
- The study addresses an important issue of utilizing waste polypropylene as a partial replacement for sand in concrete, promoting sustainability and the circular economy.
- The experimental methodology, including materials used, concrete mixing, curing, and testing procedures, follows relevant standards (ASTM, BS EN) and is described clearly.
- A range of polypropylene replacement percentages (5%, 10%, 15%, 20%) was investigated to determine the optimum level.
- In addition to compressive strength, other properties like slump, specific gravity, and water absorption were also evaluated.
- The results are presented clearly through tables and figures.
- The paper is well-structured with appropriate sections (abstract, introduction, materials/methods, results/discussion, conclusion, references).

Weaknesses/Suggestions:
- While recent related studies are cited in the introduction, a more comprehensive literature review could strengthen the context and novelty of this specific work.
- The rationale for choosing grade 25 concrete and the mix design details could be provided.
- The method of grinding/pulverizing the polypropylene waste to match sand particle size is not described in detail.
- There is no discussion on the interfacial transition zone (ITZ) between polypropylene particles and cement paste, which could influence strength.
- The results do not include statistical analysis to evaluate the significance of differences in properties at various replacement levels.
- The study is limited to compressive strength only; other mechanical properties like flexural/tensile strength, durability aspects could be valuable additions.
- Microstructural analysis (e.g., SEM) of the polypropylene-cement matrix could provide insights into the mechanisms affecting strength.

- The conclusions could be more concise and focused on the key findings directly relevant to the study's objective.

Overall, the paper presents a relevant experimental study on utilizing polypropylene waste in concrete. While the methodology is sound, addressing the above weaknesses could enhance the academic quality and impact of the work.