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

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Potential competing interests: No potential competing interests to declare.

Review Comment

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

General Comments:

The authors have conducted extensive experimental work; however, its dissemination through the research article is lacking in its current format. It is recommended that the authors rewrite the entire article in a more scientific manner, incorporating a detailed literature review in the introduction section, clearly outlining the research gap and objectives. Additionally, they should provide thorough details on materials and methodology, discuss findings comprehensively with comparisons to other works, and include micro-mechanisms regarding the mechanical behavior of concrete with fibers. Conclusions should be presented with a general summary and discussion of implementation scope.

Specific Comments:

Abstract:

1. Abstract lacks the background, purpose of the study, general conclusion, and implementation scope.
2. What about the concrete mixture proportions?

Introduction:

1. Page 2, lines 6-7: Authors showed the limitations of the steel fiber. And, “Therefore, another fiber material was developed and used in concrete such as steel fibers…..” What type of new steel fibers were used?
2. However, study on self-compacting concrete using polypropylene is still rare.. It means they have not performed a detailed literature review on this topic.
3. Multiple citations are provided without their specific contributions.
4. Introduction part is very short and basic without the detailed background, development history, and identification of the research gap. It should be rewritten in a more scientific way.

Materials:

1. Basic characteristics of cement and aggregates are not provided.

2. What is the diameter of the polypropylene fiber?
3. Table 1: What is the water-powder ratio? For what purposes are two different concrete mixture proportions used?
4. What is EFNARC? Every abbreviation used should be followed by its full form so that readers may clearly understand.
5.

Specimen Description:

1. Table 2: Does slump flow value in mm represent the flowing capacity or filling capacity?
2. Why are two different units of strength (MPa and kg/cm^2) used? Units should be consistent in text, tables, and figures.
3. Same font should be used in text, tables, and figures.
4. What was the reason for the decrease in compressive strength but increase in splitting tensile strength with the introduction of polypropylene fiber in concrete?
5. Eighteen beams were cast, each 1.8 m long, 150 mm wide, and with an overall depth of 200 mm. (in Abstract)……. All beams were 120 mm wide, 200 mm deep, and 1600 mm long. (in Specimen Description). What are the real dimensions of the beams used in the experiment???
6. How was the clear span to depth ratio of 2.8 taken in this study? What were the effective depth and effective cover to the tensile reinforcement bars?
7. Were longitudinal bars and shear stirrups designed or randomly decided?
8. What is the difference between Fig. 2 and Fig. 3? The effective span and the distance between point loads are 1400mm and 500mm, respectively, in Fig. 2. But, these values are 1250mm and 450mm, respectively, in Fig. 3. Which values are real in this study?
9. Make Fig. 5 more understandable. The vertical axis title is coincided with axis values.
10. Does the maximum deflection of the beam mean the deflection at the maximum load in this study? If it does, the maximum deflection should be amended as the deflection at the maximum load.
11. How was the maximum load defined in this study? Because all data in each case are still in ascending order. If the loads of descending order are not plotted, better to show which clearly shows the maximum load from the figure itself.
12. Table 4: Define D_m/D_M anywhere in the text or table.
13. Fig. 8: Make the vertical axis values consistent in both figures.
14. Figs. 9&10: It is better to describe crack formation and prolongation for each case in more detail.
15. What were the yield loads in each case?
16. It is better to show and describe the flexural modulus of elasticity.
17. The author has mentioned the definition of toughness but not shown data in each case.

Discussions and Conclusions

1. What does “The decreasing compressive strength is reduced by increasing the specified compressive strength of concrete.” mean? Does it mean that the decreasing of the compressive strength due to polypropylene fiber is less in higher grade concrete?
2. The heading is Discussion and Conclusions. However, no discussion is forwarded.

3. What is the general conclusion and implementation scope of this research?

Recommendation: Reject