*Article*

**Title of the article**

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1) The abstract should be brief (100-300 words) and provide a standalone summary including the research objective, methods, key findings, and conclusions. It should avoid repetitions of the main text, symbols, equations, citations, figures and tables, web links, and emails.

**Example:**

**Abstract.** This study presents new compositions of self-compacting concrete (SCC) that achieve the designed strength at 5 days of curing while maintaining the necessary workability. SCC mixtures were designed with a water-to-binder ratio of 0.35–0.40 and incorporated 10–20% fly ash as a partial cement replacement. A high-range water-reducing admixture (HRWRA) was added at 1.2–1.8% of cement weight to enhance workability. The mixtures were evaluated for slump flow and V-funnel flow time, while the compressive strength was tested at 5 and 28 days. Experimental results indicate that workability remained within 650–750 mm, with a flow rate of 9–12 s, ensuring self-compaction and preventing segregation. The SCC samples achieved a strength of 45–50 MPa at 5 days and exceeded 60 MPa at 28 days. The proposed SCC compositions provide accelerated strength gain while maintaining high workability, making them suitable for placement without compaction and early-load applications.

**Keywords:** 5-10 comma-separated words or phrases.

**1. Introduction**

2) The Introduction should provide a structured and logical flow, ensuring accessibility for readers, including non-specialists. It must begin with a general introduction to the topic, followed by a discussion of the current state of research and existing issues. Then, a literature review should be conducted, critically analyzing recent **original research articles (not reviews)** that attempted to solve the identified problems. The introduction should then define the **research gap**, formulate a **hypothesis**, and conclude with a **clear goal statement**.

a) The opening sentences of the Introduction should introduce the research topic and key terms to ensure clarity for a broad audience. Authors should explain why the topic is important, define essential concepts, and highlight the fundamental principles behind the study.

**Example:**

Self-compacting concrete (SCC) is a high-flowability material that consolidates under its own weight without external vibration, improving construction efficiency and structural quality [1]. Since conventional concrete requires mechanical compaction, which can lead to defects if performed inadequately, SCC offers an alternative that enhances durability and reduces labor requirements [2]. However, optimizing SCC mixtures remains a challenge due to the trade-off between workability and mechanical properties [3]. One of the main concerns in SCC design is early-age strength development, as many mixtures require extended curing times before they reach sufficient load-bearing capacity [4].

b) After introducing the topic, the authors must explain the current situation in the research field and identify existing issues.

**Example:**

In the case of SCC, despite its advantages, maintaining high workability while achieving early strength development remains difficult [5]. SCC mixtures often incorporate mineral additives such as fly ash and silica fume, which influence both rheology and strength gain, but their effects vary depending on dosage and curing conditions [6]. The excessive use of superplasticizers can lead to segregation, reducing the overall mechanical performance of SCC [7]. Therefore, researchers continue to explore optimized SCC compositions that balance flowability and strength while minimizing the risk of segregation [8].

c) The next section of the Introduction must include a **literature review**, focusing on recent **original studies** that attempted to solve these issues. The literature should be carefully selected to ensure relevance to the current study.

**Example:**

[9] investigated SCC with reduced water-to-binder ratios and silica fume addition, achieving a 28-day compressive strength of 65 MPa. However, the early-age strength remained below 35 MPa, making it unsuitable for rapid-construction applications. Another study [10] introduced fiber-reinforced SCC, which improved mechanical properties but resulted in excessive viscosity, reducing flowability. [11] explored the use of high-range water-reducing admixtures (HRWRAs), demonstrating improved workability but showing delayed strength gain at early curing stages. Despite these advancements, no study has successfully addressed both early-strength development and workability simultaneously.

d) Following the literature review, authors must **state the problem** that remains unresolved, based on the limitations of previous studies.

**Example:**

Most existing research has focused either on improving long-term strength or optimizing flowability, but few studies have provided a balanced approach that ensures both high early-age strength and adequate workability. As a result, there is still a need to develop SCC mixtures that can achieve high compressive strength within the first few days of curing while maintaining self-compacting properties without segregation.

e) Based on this problem statement, authors should **formulate a hypothesis** that will be tested in the study. A hypothesis is a reasoned assumption that explains how the existing research gap could be addressed.

**Example:**

It can be hypothesized that incorporating a controlled proportion of fly ash and HRWRAs will enable the development of SCC with an optimal balance between early strength gain and workability.

f) Finally, the **goal statement** should clearly define the study’s objectives and highlight its novelty.

**Example:**

The goal of this study is to develop self-compacting concrete mixtures that achieve a compressive strength of at least 45 MPa within 5 days while maintaining sufficient flowability, ensuring a slump flow of 650–750 mm and a V-funnel flow time of 9–12 seconds [15]. By optimizing the mix design with selected mineral and chemical admixtures, this research aims to provide a solution for early-load applications in construction, addressing a gap that previous studies did not fully resolve.

**2. Methods**

3) The Methods section should provide a **clear and sequential** description of the actions performed in the study, ensuring that the research can be **replicated**. Authors must specify the **resources used**, including methodologies, techniques, materials and their properties, equipment and their parameters, and software. **Each mention of an existing methodology or resource should be supported by citations rather than redundant explanations.** Additionally, the Methods section must avoid presenting results and instead focus only on the procedures undertaken. Authors are encouraged to **perform statistical analysis** and specify the methods or equations used. The clarity of procedure descriptions is more important than volume, so the section should be as concise as possible while maintaining completeness.

a) The **sequence of procedures** should be presented logically to ensure replicability. Authors should begin by describing the **materials** used, followed by the **experimental procedures**, including sample preparation, testing methods, and analysis techniques.

**Example:**

SCC mixtures were prepared using Portland cement (CEM I 42.5 N), fly ash, and a high-range water-reducing admixture (HRWRA), with proportions selected based on previous studies [11]. The materials' properties were sourced from supplier data sheets [12], and no modifications were made.

b) Next, authors must **describe the experimental setup** in detail, including equipment and parameters, citing sources where applicable.

**Example:**

Fresh SCC properties were evaluated according to the slump flow test [13] and V-funnel test [14], using a standardized slump cone and V-funnel apparatus [15]. The slump flow diameter and flow time were recorded for each mix. Compressive strength was measured using a universal testing machine Instron 5967 [16] with a 100 kN load capacity at loading rates of 0.5 MPa/s, following [17].

c) **Any software used for data processing** should be explicitly mentioned. If statistical analysis was conducted, authors must specify the methods and equations used.

**Example:**

Statistical analysis was performed using SPSS v.26 [18], applying one-way ANOVA [19] to determine the significance of differences in compressive strength across mixtures. The coefficient of variation (CV) was calculated for each dataset to assess data consistency.

d) The **Methods** section **should not include results**. For example, if the chemical composition of materials was determined through laboratory testing, authors should **only state that such tests were performed**.

**Example:**

 The oxide composition of cement and fly ash was analyzed using X-ray fluorescence (XRF, Malvern Panalytical Axios MAX), following [19], and the results are presented in the Results section.

e) If material properties were obtained from other studies, authors should cite the source instead of restating values.

f) Finally, the length of the Methods section should reflect the complexity of the study. If a short but complete description allows for full **reproducibility, conciseness is preferred**. The focus should be on **clear, structured descriptions of procedures rather than unnecessary elaboration**.

**3. Results and Discussion**

4) The Results and Discussion section should present findings **in the same order as stated in the Methods section** to ensure logical flow. Authors should prioritize **tables and illustrations (figures, infographics, or graphs)** over plain text to improve clarity and accessibility. **Each result** must first be introduced in text form, followed by its corresponding table or figure, and then **described in detail**. After describing each result, authors should **identify trends and patterns** before engaging in a **discussion** that **compares** their **findings** with previously published research **from the literature review in the Introduction**.

a) Each result must begin with an introductory sentence that cites the relevant table or figure. Following this statement, the table or figure should be placed in the manuscript.

**Example:**

The results of the slump flow and V-funnel tests are presented in Table 1.

Table 1 – Example of a table

|  |  |  |
| --- | --- | --- |
| Mix ID | Slump flow, mm | Flow time, s |
| SCC-1 | 720 ± 15 | 10.2 ± 0.3 |
| SCC-2 | 690 ± 12 | 9.5 ± 0.2 |
| SCC-3 | 650 ± 10 | 9.0 ± 0.1 |

b) After presenting the table or figure, authors must **describe the data in detail**, ensuring that readers who prefer text-based explanations can fully understand the results.

**Example:**

The slump flow of SCC mixtures ranged from 650 mm to 720 mm, indicating adequate flowability. The highest flow value of 720 mm was observed for SCC-1, while SCC-3 exhibited the lowest flow at 650 mm. V-funnel flow times ranged between 9.0 and 10.2 seconds, confirming good workability with minimal variation among mixtures.

c) After descriptions, authors should **identify trends and patterns** emerging from results.

**Example:**

A clear trend was observed, where a decrease in the water-to-binder ratio resulted in reduced slump flow and slightly lower V-funnel times. This indicates that the viscosity of the SCC mixtures increased with lower water content, leading to improved cohesiveness.

d) Next, authors must **discuss the findings, comparing them with** previous studies **cited in the literature review of the Introduction**. The discussion should **highlight similarities, differences, and possible explanations** for any deviations.

Example:

The observed slump flow values align with the findings of [11], where SCC mixtures with similar HRWRA dosages achieved comparable flowability. However, the V-funnel times in this study were slightly lower than those reported by [9], which could be attributed to differences in fine aggregate gradation. Despite achieving satisfactory workability, the results indicate a trade-off between flowability and cohesiveness, which is consistent with previous research [10].

e) **Each procedure** mentioned in the Methods section **must have** corresponding **results**, ensuring completeness and consistency. If compressive strength tests were performed, results should follow the same structured approach.

**Example for the next result:**

The compressive strength results at 5 and 28 days are summarized in Figure 1.

Figure 1 – Example of a single figure

As shown in Figure 1, SCC-1 achieved the highest early-age strength of 50 MPa at 5 days, while SCC-3 exhibited the lowest strength of 45 MPa. At 28 days, all mixtures exceeded 60 MPa, indicating sufficient long-term strength. The inclusion of fly ash contributed to strength development, consistent with findings in [10]. However, the slightly lower early strength compared to conventional SCC without fly ash [11] suggests a delayed hydration effect."

**4. Conclusions**

5) The Conclusion must be **concise and to the point**, summarizing key findings **with numerical values**, stating **observed patterns**, and highlighting the study’s contributions. No new data or references should be introduced. The enumerated conclusions are preferred.

a) Authors should briefly state the main results, avoiding unnecessary repetition.

**Example:**

1. This study developed SCC mixtures achieving a compressive strength of 45–50 MPa at 5 days and exceeding 60 MPa at 28 days while maintaining a slump flow of 650–750 mm and a V-funnel flow time of 9–12 s.

b) Any major tendencies found in the study should be clearly mentioned.

**Example:**

2. It was observed that reducing the water-to-binder ratio increased early-age strength but decreased workability. Additionally, higher fly ash content delayed strength development but improved long-term performance.

c)Authors should explicitly state whether the study addressed the research problem.

**Example:**

3. The proposed SCC mix successfully balanced workability and early strength, overcoming the trade-off reported in previous studies.

d) If applicable, briefly mention how the findings can be used.

**Example:**

4. These SCC compositions are suitable for early-load applications, accelerating construction schedules while ensuring high flowability.

e) Mention constraints and possible further studies.

**Example:**

5. Further research is needed to assess long-term durability under real construction conditions.

**Acknowledgments**

This section is optional and may provide (exclude if not applicable). In this section, the authors may indicate funding sources and grants, agencies, or individuals that supported the current study. When doing so, the authors are requested to carefully check the grant number, and (or) order of funding sources.

**References**

6) All the references should adhere to the journal’s formatting style. Excessive self-citation is discouraged unless directly relevant. Authors are encouraged to use software like Mendeley for consistency and error-free formatting.

a) Each reference should be recognizable and findable.

b) Every reference listed must be cited in the text, and vice versa.

c) Each reference must include all necessary details (authors, title, journal/conference name, volume, issue, pages, year, DOI if available).

d) The references should be presented in Latin letters and adjusted to the IEEE style.

e) The Cyrillic references should be transliterated; the [transliteration tool](https://www.itranslit.com/) can be used.

**Example:**

[1] R. Lukpanov, D. Dyussembinov, A. Altynbekova, and Z. Zhantlesova, “Research on the effect of microsilica on the properties of the cement-sand mixture,” *Technobius*, vol. 2, no. 4, p. 0027, 2022, doi: 10.54355/tbus/2.4.2022.0027

[2] R. Cingi, B. Balapanov, M. Uysal, B. F. Aygun, S. Montayev, and O. Canpolat, “Alkali-activated composites with synthetic fibers and recycled aggregates: a study of mechanical properties,” *Technobius*, vol. 4, no. 2, p. 0058, 2024, doi: 10.54355/tbus/4.2.2024.0058

[3] T. Samoilova, M. Rakhimov, G. Rakhimova, and N. Zhangabay, “Effect of heat treatment of expanded polystyrene concrete on its compressive strength,” *Technobius*, vol. 4, no. 2, p. 0059, 2024, doi: 10.54355/tbus/4.2.2024.0059

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**Author Contributions:**

*Name Surname* – concept, methodology, resources, data collection, testing, modeling, analysis, visualization, interpretation, drafting, editing, funding acquisition.

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- Make Sub-sections italic and alight them to the left edge with an empty line of 12 pt before

- Figures and Tables must appear centered with no offset after their first mention in the text being cited as (Figure 1) or Figure 1, and not extending beyond page margins

- Captions for figures and tables must be standalone, descriptive, and centered; figure captions go below, and table captions above

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- For multiple figures in a row, use an invisible table for alignment and center captions appropriately

- Use hyphens and commas when citing multiple figures or tables (e.g., Figures 6-8 or Figures 6, 7, 8-9)

- Use at least 1 figure or table and provide their detailed description (trends)

- Exclude vertical lines in tables

- Use a standard equation editor for the equations, number them as (1) and cite them as Eq. (1) or Eq. (1-3) for multiple

- Do not use Cyrillic letters

- Ensure good English using [Grammarly](https://www.grammarly.com/)

- Use proper citations, preferably recent references indexed in Scopus and Web of Science

- Adjust citations and References to [IEEE style](https://journals.ieeeauthorcenter.ieee.org/wp-content/uploads/sites/7/IEEE_Reference_Guide.pdf) using [Mendeley](https://www.mendeley.com/)

- Use an online [transliteration tool](https://www.itranslit.com/) for Cyrillic references

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Figure 1 – Example of a single figure

 

Figure 2 – Example of a single figure

|  |  |
| --- | --- |
|  |  |
| Figure 3 – Example of several figures in a line | Figure 4 – Example of several figures in a line |

|  |  |
| --- | --- |
|  |  |
| a) Name of Figure 5a | b) Name of Figure 5b |
| Figure 5 – Example of several figures in a line with a joint name  |

Table 1 – Example of a table

|  |  |  |  |
| --- | --- | --- | --- |
| Column 1 | Column 2 | Column 3 | Column 4 |
| Row 1 |  |  |  |
| Row 2 |  |  |  |
| Row 3 |  |  |  |

$\left(x+a\right)^{n}=\sum\_{k=0}^{n}\left(\genfrac{}{}{0pt}{}{n}{k}\right)x^{k}a^{n-k}$ (1)

Where: *n* – number; *k* – coefficient; etc.