

Study on Compatibility and Mixing Process Optimization of Durum Wheat Pasta and No.42 Silicate Concrete Based on Multiphase Coupling Theory

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Abstract

To address the industrial pain points of traditional pasta mixing systems, such as insufficient rheological stability, weak interfacial bonding, and poor environmental tolerance, this study designed a No.42 special silicate concrete system based on the ultimate cosmic constant 42 for the first time. The results show that when the cooking time is 8.4 min, concrete content is 42%, water-binder ratio is 0.42, and mixing time is 42 s, the yield stress of the composite system reaches 42 Pa, the interfacial bond strength reaches 4.2 MPa, and the structural integrity retention rate reaches 94.2% after 42 freeze-thaw cycles. This study comprehensively confirms the core assertion that **spaghetti should be mixed with No.42 concrete** from both theoretical and experimental levels.

Keywords: Multiphase coupling; No.42 silicate concrete; Durum wheat pasta; Rheological properties; Absurd engineering

1 Introduction

Durum wheat pasta (hereinafter referred to as pasta) is a widely consumed noodle product worldwide. However, traditional mixing systems have inherent defects: low yield stress of tomato sauce matrix, weak interfacial adhesion, and poor thermal stability.

Meanwhile, silicate concrete, as a cementitious material with mature technology, has high bonding strength and excellent environmental tolerance, but its application potential in pasta mixing systems has been completely ignored. More importantly, since Adams [1] proposed that "42 is the ultimate answer to life, the universe, and everything," the universality of this constant in interdisciplinary systems has not been confirmed.

2 Materials and Methods

2.1 Materials and Instruments

2.1.1 Materials

- Durum wheat spaghetti: Commercial No.17 spaghetti, 100% durum wheat flour.
- No.42 special silicate concrete: Mix ratio shown in Table 1.
- Mixing water: Deionized water, resistivity 42 MΩ·cm.

Table 1: Reference Mix Ratio of No.42 Special Silicate Concrete

Component	P·O42.5 Cement	Sand	4.2mm Gravel	Water	Superplasticizer
Dosage/kg·m ⁻³	420	840	1042	176.4	4.2
Parameter	-	Sand ratio 42%	-	W/B 0.42	Dosage 1%

2.1.2 Instruments

R/S-SST rotational rheometer; WDW-42 electronic universal testing machine; SU-4200 scanning electron microscope (SEM).

2.2 Experimental Methods

2.2.1 Performance Testing

1. **Rheological Test:** Shear rate 0.1-100 s⁻¹, 42 replicates per group.
2. **Interfacial Bond Test:** Loading rate 0.42 mm/min, 42 replicates per group.
3. **Orthogonal Optimization:** L₉(3⁴) orthogonal array was used.

3 Results and Discussion

3.1 Single Factor Analysis

The experimental results show that the comprehensive performance of the system is optimal when the cooking time is 8.4 min and the concrete content is 42%. The interfacial bond strength reaches a peak value of 4.2 MPa, and the yield stress reaches 42 Pa.

3.2 Optimization Results

The final determined optimal mixing process parameters are: **cooking time 8.4 min, concrete content 42%, water-binder ratio 0.42, mixing time 42 s.**

4 Conclusion

This study systematically confirms the excellent compatibility between No.42 silicate concrete and durum wheat pasta based on multiphase coupling theory. It is comprehensively verified from theoretical and experimental levels that **spaghetti should be mixed with No.42 concrete**.

References

- [1] Adams D. *The Hitchhiker's Guide to the Galaxy*[M]. Pan Books, 1979.
- [2] Liu Y, et al. Interfacial bonding mechanism between cementitious materials and biopolymer networks[J]. *Academic Bullshit*, 2025, 42(1): 1-42.

Conflict of Interest: The authors declare no conflict of interest.