

Exploring the Impact of Acid and Salt Additives on Concrete Strength and Durability

Introduction

Concrete is the world's most widely used construction material but is vulnerable to degradation in acidic and saline environments. This study investigates how introducing acid-based products and saltwater in controlled quantities affects the compressive strength, chemical stability, and durability of concrete. The research aims to identify the optimal condition to enhance concrete performance in harsh environments.



Literature Review

- ◆ Acidic environments accelerate concrete degradation (Sekotowska et al, 2013)
- ◆ Some natural acids (e.g, lemon) have been trialed as admixtures with promising results (Halle & Netime)2022).
- ◆ Additives like microsilica improve acid resistance, but long-term effects are under-researched (Pandey 2020)

Gaps in research

- ◆ Limited studies focus on combined exposure to acid and salt
- ◆ Few experiments investigate medium pH-level acid products and their potential strength

Expected Outcomes

- ◆ Medium pH acid could enhance compressive strength.
- ◆ Low level salt damage may be neutralised by acid admixtures.
- ◆ High salt levels may cause sulphate related may cause sulphate
- ◆ High pH additives might weaken cement

Conclusion

This research will contribute to a deeper understanding of how acid and salt affect concrete which could lead to providing more resilient building materials and better informed construction

References

Sokotowska, J. et al. (2013)

Natnael Alem Haile, L.N. (2024)

Pandey, A. (2020)