IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, April 2025
Impact Factor: 7.67

Impact Strength and Permeability Test on Self Compacting Concrete and Determination of Shrinkage and Crack

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Abstract: *Self-Compacting Concrete (SCC) is an innovative concrete mixture that flows under its own weight and fills formworks without the need for mechanical vibration. This property makes SCC an attractive alternative to conventional concrete, particularly in applications where vibration is difficult or undesirable. The primary objective of this study is to evaluate the impact strength and permeability characteristics of SCC, along with its shrinkage behavior and crack development over time. The research involves a series of laboratory tests, including drop-weight impact testing to assess SCC's resistance to dynamic loading and water permeability tests to measure its durability. Additionally, shrinkage monitoring was conducted under controlled conditions to understand SCC's dimensional stability, while crack development analysis was performed using digital imaging techniques. The results indicate that SCC exhibits moderate impact resistance, low permeability, minimal shrinkage, and controlled crack propagation, making it a promising material for durable and long-lasting structures. This study provides valuable insights into the mechanical and durability performance of SCC, reinforcing its potential applications in the construction industry while highlighting areas for further improvement.*

Keywords: Permeability, Shrinkage, Crack, Self compaction, High impact strength, crack development