

Measuring Early Shrinkage Strain of Concrete and Grout

A Device for accurately measuring linear and volumetric shrinkage strain in concrete and grout after mixing, offering a crucial solution to mitigate shrinkage-related issues in construction. Optimizes concrete mix designs and enhances the durability of structures.

Case ID:
ID2023-012

IP Position:
Patent Pending

Development Status:
TRL 8: Technology proven to work in its final form and under expected conditions.

Opportunity
Partners sought for testing and licensing.

Category(s):
Concrete, Grout, Admixtures, Shrinkage, Construction Technology, Structural Integrity, Civil Engineering, Building Materials

Keywords:
Fresh Concrete, Cement Grout, Early Shrinkage Measurement, Mix Optimization, Mineral and Chemical Admixtures, Infrastructure Durability

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Inventor(s):
Professor Akthem Al-Manaseer

Contact Information:
Sandeep Mukkamala
Intellectual Property Specialist
Sandeep.Mukkamala@sjsu.edu
408-924-5462

Technology Overview

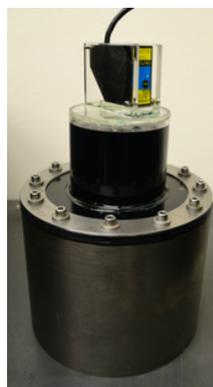
- This invention addresses the critical issue of early shrinkage in concrete structures caused by the reduction in absolute volume of solids and liquids in the cement paste resulting from cement hydration during construction. It introduces a novel device that accurately measures early shrinkage strain, offering a precise solution to monitor and mitigate concrete and grout shrinkage issues.
- Provides significant advancements over current methods, offering improved accuracy and early detection capabilities. It is intended for use in the construction industry to optimize concrete mix designs and enhance the integrity of concrete structures.
- Overall, this innovation promises to revolutionize concrete construction by addressing a critical structural concern with a reliable and accurate measurement solution.

Key Features & Benefits

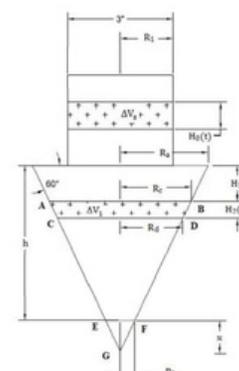
- **Novel Measurement Device:** Accurately measures early shrinkage strain in concrete and grout after mixing, providing a precise and reliable method for monitoring linear and volumetric strain change in the fresh and hardened phases.
- **Shrinkage Types:** Allows for measuring early shrinkage strain, autogenous shrinkage strain, and drying shrinkage strain to prevent potential structural concerns.
- **Controlled Testing Environment:** Operates in a controlled environment with sealed concrete or grout specimens covered with non-shrinkage oil, ensuring consistent and repeatable accuracy of results.
- **Early Detection and Mitigation:** Allowing for proactive measures to be taken to prevent or mitigate potential early structural problems in concrete, enhancing the structure's integrity.

Potential Applications

- **Construction Industry:** Optimizing concrete and grout mix designs to enhance the integrity of structures.
- **Civil Engineering:** Monitoring and mitigating early shrinkage strain issues in bridges, roads, and other infrastructure.
- **Architecture:** Ensuring long-term durability and stability of concrete elements in buildings.
- **Quality Control:** Optimizing the performance of different concrete and grout mixes with admixtures to reduce early shrinkage strain.



Mold and Testing Assembly



Schematic Sketch of Device

