

## Analyzing the Effect of Biomass and Cementitious Materials on Air Content in Concrete

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**Abstract :** A push for sustainability in the concrete industry is increasing. Cow manure itself is becoming a problem and having the potential solution to use it in concrete as a cementitious replacement would be an ideal solution. For cow manure ash to become a well-rounded substitute, it would have to meet the right criteria to progress in becoming a more popular idea in the concrete industry. This investigation primarily focuses on how the replacement of cow manure ash affects the air content and air void distribution in concrete. In order to assess these parameters, the Super Air Meter (SAM) was used to test concrete in this research. In addition, multiple additional tests were performed, which included the slump test, temperature, and compression test. The strength results of the manure ash in concrete were promising. The manure showed compression strength results that are similar to that of the other supplementary cementitious materials tested. On the other hand, concrete samples made with cow manure ash showed 2% air content loss and an increasing SAM number proportional to cow manure content starting at 0.38 and increasing to 0.8. In conclusion, while the use of cow manure results in loss of air content, it results in compressive strengths similar to other supplementary cementitious materials.

**Keywords :** air content, biomass ash, cow manure ash, super air meter, supplementary cementitious materials

**Conference Title :** ICCCC 2019 : International Conference on Cement and Concrete Composites

**Conference Location :** San Francisco, United States

**Conference Dates :** September 26-27, 2019