

Capsule-Like Smart Aggregate for Portable Impedance Monitoring in Concrete Structures

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ABSTRACT

This study is to develop a capsule-like smart aggregate (CSA) for portable impedance monitoring in concrete structures. Firstly, an impedance model of a CSA-embedded concrete structure is outlined. Secondly, a prototype design of the CSA is presented to obtain impedance signals sensitive to incipient damage in concrete structures. A numerical modal analysis is conducted to predetermine an effective frequency range less than 100 kHz of the CSA for portable impedance monitoring. Thirdly, the feasibility of the CSA is evaluated via numerical and experimental investigations under compression forces. The sensitivity of the CSA is also compared with an existing smart aggregate to verify the prominent features of the CSA for impedance-based structural health monitoring.

REFERENCES

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