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Project Title

SMART CONCRETE HAVING SELF-X CAPABILITIES IN CONCRETE STRUCTURE

Abstract:

Intelligent concrete refers to the structural materials which can sense the changes of environment and make suitable responses by altering one or more working parameters in real time.

The 'intelligent' properties of concrete are achieved mainly by improving the composition of raw materials or combining some functional materials with concrete matrix, thus leading to the concrete possessing bionic features.

Compared to conventional concrete, a properly designed intelligent concrete can be applied to optimize the safety, longevity and function of infrastructures and reduce the life-cycle costs, resource consumption and environment pollution, which will lay a material foundation for building smart cities.

In the past few decades, considerable efforts have been put towards the research of intelligent concrete and many innovative achievements have been gained in the development and application of intelligent concrete.

Thirteen types of intelligent concrete emphasizing on its self-x capabilities are systematically reviewed in this paper, with attentions to their principles, composition, fabrication, properties, research progress and structural applications. In addition, some comments and prospects for the development of self-x concrete are also discussed.

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