

**MULTIFUNCTIONAL RC STRUCTURES WITH SELF-SENSING** NANO MODIFIED CEMENTITIOUS COMPOSITES

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## Abstract

The development of new cementitious nanocomposites with enhanced properties permits the prodution of novel construction multifunctional materials. In particular, recent researches show that carbon-based nanofillers are able to provide cementitious materials with better physical and mechanical properties. This paper focuses on the additional capability of self-monitoring of strain and stress states. The authors are carrying out experimental tests on construction materials able to monitor the structural behaviour of the structures they are embedded in or they compose. A diffuse monitoring is crucial to identify possible incipient damages and structural issues, particularly important for the safety of the users both in service conditions and after critical events. The sensing property is achieved through the correlation between the variations of strains or stresses and the variations of electrical parameters, such as Ohmic resistance. The results of the experimental campaign demonstrate that cementitious composites doped with nanofillers are promising for the manufacturing of structural materials with monitoring abilities. Further investigations are desirable to solve some issues related to their application in real structures: the optimization of the fabrication process and of the electrical measurements, as well as the issues related to the continuous monitoring.

## Nanomodified cement-based materials for sensors

CARBON-BASED NANOCOMPOSITE



## Structural elements with smart nanomodified

## sensors



**Functioning Mode** 

