

# Accepted Manuscript

Fresh and mechanical properties, and strain sensing of nanomodified cement mortars: The effects of MWCNT aspect ratio, density and functionalization

Maria S. Konsta-Gdoutos, Panagiotis A. Danoglidis, Maria G. Falara, Stephanos F. Nitodas



PII: S0958-9465(16)30843-5

DOI: [10.1016/j.cemconcomp.2017.05.004](https://doi.org/10.1016/j.cemconcomp.2017.05.004)

Reference: CECO 2826

To appear in: *Cement and Concrete Composites*

Received Date: 12 December 2016

Revised Date: 11 May 2017

Accepted Date: 12 May 2017

Please cite this article as: M.S. Konsta-Gdoutos, P.A. Danoglidis, M.G. Falara, S.F. Nitodas, Fresh and mechanical properties, and strain sensing of nanomodified cement mortars: The effects of MWCNT aspect ratio, density and functionalization, *Cement and Concrete Composites* (2017), doi: 10.1016/j.cemconcomp.2017.05.004.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **Fresh and mechanical properties, and strain sensing of nanomodified**  
2 **cement mortars: the effects of MWCNT aspect ratio, density and**  
3 **functionalization**

4 Maria S. Konsta-Gdoutos<sup>1,\*</sup> Panagiotis A. Danoglidis<sup>1</sup>, Maria G. Falara<sup>1</sup>,  
5 and  
6 Stephanos F. Nitodas<sup>2</sup>

7 <sup>1</sup>*Department of Civil Engineering, Democritus University of Thrace, Xanthi, Greece*

8 <sup>2</sup>*Glonatech S.A. TE.S.P.A "Lefkippos" Ag. Paraskevi, GR-15341, Attica, Greece*

9 **Abstract**

10 *Keywords:* Mortars; carbon nanotubes; functionalization; bulk density; aspect ratio; flexural  
11 strength, stiffness; toughness; strain sensing

12 **Abstract**

13 A comprehensive analysis on the effect of aspect ratio, bulk density and functionalization of  
14 multi walled carbon nanotubes (MWCNTs) in the development of nanomodified mortars,  
15 reinforced with different types of MWCNTs is presented herein. A structural  
16 characterization of the pristine and functionalized carbon nanotubes was carried out with  
17 scanning electron microscopy (SEM), transmission electron microscopy (TEM), and  
18 thermogravimetric analysis (TGA). A simple one step dispersion method, involving the  
19 application of ultrasonic energy and the use of a superplasticizer (SP) was utilized for the  
20 preparation of uniformly dispersed MWCNT suspensions. The experimental determination  
21 of the fresh and 28d mechanical properties of mortars with w/c=0.5 and s/c=3.0, using four  
22 different types of well dispersed pristine and functionalized MWCNTs at an amount of 0.1  
23 wt% of cement took place through: (i) flow and time of setting tests; (ii) three point bending  
24 experiments on 4x4x16cm specimens; and (iii) uniaxial compression on the half prisms of the

---

\* Corresponding author. Tel.:+30-25410-79658; fax:+30-25410-79838  
*E-mail address:* mkonsta@civil.duth.gr

Download English Version:

<https://daneshyari.com/en/article/5436781>

Download Persian Version:

<https://daneshyari.com/article/5436781>

[Daneshyari.com](https://daneshyari.com)