Improvements of Strength and Dynamic Elastic Characteristics of Mortars by Using Carbon Nano-Tubes

Daniel COVATARIU1[0000-0002-9122-6886], Mihai-Sergiu ALEXA-STRATULAT2[0000-0003-4519-5721] and Ionut-Ovidiu TOMA3[0000-0001-5261-6593]

1 Lecturer, The “Gheorghe Asachi” Technical University of Iasi, Iasi, 700050, Romania,

[daniel.covatariu@tuiasi.ro](mailto:daniel.covatariu@tuiasi.ro)

2 Researcher, The “Gheorghe Asachi” Technical University of Iasi, Iasi, 700050, Romania,

mihai.stratulat@tuiasi.ro

3 Lecturer, The “Gheorghe Asachi” Technical University of Iasi, Iasi, 700050, Romania

ionut.ovidiu.toma@tuiasi.ro

**Abstract.** The paper presents the preliminary results in terms of strength and dynamic elastic properties obtained on mortar prisms. The bending tensile and the compressive strength of regular and carbon nano-tubes (CNT) mortar were determined by means of standardized tests at the age of 28 days. Prior to assessing the strength value, non-destructive testing was used to determine the dynamic elastic characteristics, namely dynamic longitudinal modulus of elasticity and material damping ratio. The use of CNT in the mortar mix led to a reduction in the self-weight and improvements of both strength and elastic properties of the material. This proves to be an alternative solution for a sustainable structural rehabilitation of buildings due to lower material consumption and consequently lowered CO2 emissions.

**Keywords:** carbon nano-tubes mortar, strength, dynamic modulus of elasticity