

Abstract Submitted
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Effect of Carbon Nanomaterials Embedded in a Cementitious Matrix CLARISSA ROE, Western Kentucky Univ — In the current study, we have carried out an investigation on monoliths of novel cementitious composites with embedded carbon nanomaterials (CNMs). Cementitious samples were prepared using the carbon allotropes C₆₀, Carbon Nanotubes, and Graphene Oxide. Due to their varying geometry, the steric effect on strength of the resulting monoliths was measured against the varying CNM concentrations. Results provide evidence that due to the dissimilar geometry and amount of CNM added, the CNMs disperse within the cement in different ways. Real-space imaging was obtained using the Large Chamber Scanning Electron Microscope (LC-SEM) at the WKU Nondestructive Analysis (NOVA) Center using Backscattered Electrons. The resulting strength of these cementitious composites was investigated using a uniaxial load frame. Comparing these results with the LC-SEM imaging provides a more comprehensive picture into the development of materials that are strong and durable relative to the abovementioned differences in CNM geometry and mass. Future studies will include the use of small-angle neutron scattering to provide independent data confirming measurement of the size and distribution of the CNM's within the cementitious matrix. The results of this study will be compared to future tests performed aboard the International Space Station to determine the effect of gravity on the CNM dispersion and resulting cement monolithic strengths.

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