

Abstract Submitted
for the SES06 Meeting of
The American Physical Society

The Functionalized Double-Walled Nanotube S.J. FRANKLAND, National Institute of Aerospace, G.M. ODEGARD, Michigan Technological University, T.S. GATES, NASA Langley Research Center — Functionalized nanotube materials are being proposed as fillers in polymer matrix materials for aerospace applications. Chemical modification (functionalization) of nanotubes enables better association with the polymer, but in doing so, changes in the molecular structure of the nanotube. In functionalized double-walled nanotubes (f-DWNT), the outer nanotube is made compatible with the polymer while the inner nanotube is pristine. In the present work, molecular dynamics (MD) simulation and the equivalent continuum method are used to calculate mechanical properties of f-DWNTs. Young's moduli have been calculated for multiple f-DWNT systems. MD simulations also demonstrate that the f-DWNT have friction coefficients on the order of one reducing the degree of nanotube slippage in a composite. The paper will present results for the Young's modulus and friction coefficients of f-DWNT systems.

S. J. Frankland
National Institute of Aerospace

Date submitted: 21 Aug 2006

Electronic form version 1.4