Materials & Chemicals

# ARCHITECTED CARBON NANOTUBE FOAMS AND METHODS OF MAKING SAME

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Inventors: Ramathasan Thevamaran, Abhishek Gupta, Komal Chawla, Bhanugoban Maheswaran

## The Invention

UW-Madison researchers have designed and fabricated architected vertically aligned carbon nanotube (VACNT) foams with synergistic improvements in specific elastic modulus, specific energy absorption, and specific compressive strength. The VACNT foams have a hierarchical structure with feature sizes ranging from a few angstroms to several millimeters. The individual CNT's multiwalled structure at the nanoscale, along with their entangled forest-like morphology in the microscale that further forms into vertically aligned bundles in the mesoscale, makes them undergo collective sequentially progressive buckling under compressive loading. They exhibit bulk strain recovery of over 80% and also exhibit superior thermal stability. The hierarchical structure of the VACNT foams can be tailored to alter their bulk properties dramatically by varying synthesis parameters and introducing micropatterned growth processes. An additional level of structural hierarchy was introduced in the VACNT foams through an architected hexagonally packed lattice of hollow cylinders in the mesoscale. Hollow cylinders provide additional structural rigidity to the foams and the hexagonal pattern allows close packing that enhances interactions among the neighboring cylinders.

## Additional Information

**For More Information About the Inventors**

- Ramathasan Thevamaran

**Publications**

- Read a news story about this technology.

**Tech Fields**

- Materials & Chemicals : Composites
- Materials & Chemicals : Synthesis

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867