



Diagram & Data

## Technology Summary

Nanostructures have become attractive additives to aluminum due to their unique properties. The technology uses carbon nanotube hybrid as reinforcement in the aluminum. This hybrid allows for an enhanced electrical conductivity, enhanced mechanical properties, enhanced thermal conductivity, and a reduced coefficient of thermal expansion while maintaining the unique lightweight properties of aluminum. These properties can be obtained by using an in situ inductive heating stirring mechanism to achieve uniform dispersion of the carbon nanotubes in the aluminum matrix. These nanocomposites can be used in electrical wires as a possible substitute for copper. This technology demonstrates the ability to improve the electrical, mechanical, and thermophysical properties of aluminum, thereby making it comparable to or better than copper.

## Application & Market Utility

Al-CNT composite improves thermophysical and mechanical properties, as well as electrical conductivity. Composite still maintains lightweight properties of aluminum. Potential applications include the automobile, aerospace, structural, electronic and sports industries.

## Next Steps

Composite wires have been fabricated and tested; looking to optimize the technology and achieve improvements in electrical, mechanical, and thermophysical properties.

### TECHNOLOGY READINESS LEVEL

4-7

#### Seeking

Licensing |

#### Keywords

- Carbon nanotubes
- conductors
- high performance
- composite
- metal matrix

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