The NASA

LangleyEdge

NASA Langley Research Center

NASA Langley Research Center is actively seeking partnerships to commercialize its Flexible Carbon Nanotube Structural Health Monitoring Sensor technology.

The Market Opportunities

- Global real-time information for smart skin technologies
- Aircraft and spacecraft applications:
  - applications in safety, fuel efficiency, and control
- Automotive applications:
  - strain-based measurements for temperature and pressure
  - engine-torque conversion
  - monitoring of vehicle compartment noise
  - air bag triggers
  - strain sensor arrays in vehicle crumple zones
  - passenger seat temperature/pressure sensors
- Civil engineering applications:
  - testing new configurations and materials for potential areas of integrity failure

The Benefits

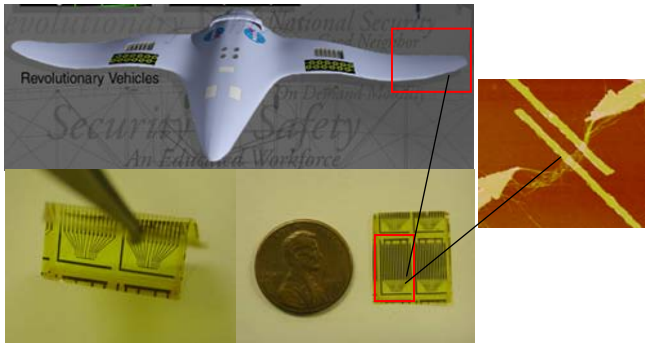
- Provides sensor information critical for safe operation of exploratory, military or commercial transportation systems
- Enables preventive action to mitigate structural health degradations

The Technology

This invention uses a single-walled carbon nanotube (SWCNT)-based sensor for structural health monitoring. Because the sensor can be constructed on either rigid or flexible substrates, it lends itself to the development of sensor skin technology, capable of measuring critical parameters over an entire surface.

Flexible Carbon Nanotube-Based Structural Health Monitoring Sensor

Real-time continuous monitoring for structural or surface health



Carbon Nanotube Flexible Sensor for Structural Health Monitoring.

The device capitalizes on the unique mechanical and electrical properties of SWCNTs. SWCNTs are one of the strongest known materials and can exhibit either semiconducting or metallic behavior based on the chirality of the tube. Ballistic and spin coherent transport have also been exhibited. For this technology, SWCNTs have been integrated into a structural health monitoring system relying upon the change induced in the conductance of the SWCNTs by strain. As a result of these properties, fabrication of several SWCNT-based nanoscale devices, including field effect transistors, molecular logic devices, and gaseous analyte detectors are possible.

Additional Information

To discuss in detail how this technology can profit you and your business, please contact:

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