

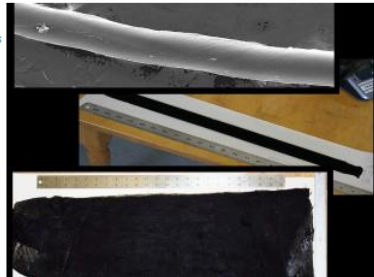


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### Houston & Texas News

Nanotubes are about 1 billionth of a meter across, as in the electron microscope photo at top. A new process can make them long enough to be woven into yarn, as in the photos at center and bottom.



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May 14, 2007, 9:46PM

## Firm takes a giant step with the tiny nanotube

Company finds breakthrough to produce material for widespread commercial use

By ERIC BERGER  
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Tiny carbon nanotubes are long on promise.

They're strong: 100 times stronger than steel.  
Lightweight: 30 percent lighter than aluminum. And  
conductive: they dissipate heat and carry electricity as  
efficiently as copper.

What the mighty nanotube — cylindrical shaped and just 1 nanometer across, about 80,000 times narrower than a human hair — has lacked is an efficient means of production to put its titanic powers toward a commercial end. Most manufacturing methods have produced powdery clumps of nanotubes.

A New Hampshire-based company, Nanocomp Technologies, claims to have changed that. The company's chief executive, Peter Antoinette, said Nanocomp has succeeded in producing nanotubes that are a few tenths of an inch long, or hundreds of thousands of times longer than they are wide.

They also have developed a process to spin these long nanotubes into threads and yarns, which is key to making functional materials such as bulletproof armor, highly efficient power lines and material that can store electricity.

In the field of nanotechnology, carbon nanotubes are viewed as the most promising material because of their strength-to-weight ratio. They are strong enough, some enthusiasts say, to build an elevator into space.

More near-term applications are myriad. Consider a laptop made with conductive materials integrated into the case. It would be far stronger than any current laptop, wouldn't leak radiation and contain a much more powerful antenna for picking up wireless Internet signals.

"We think we have a relatively straightforward path to scaling this process up and automating it," Antoinette said.

Within a few years, Nanocomp hopes to build an industrial-scale facility and produce its yarns and threads for about \$85 a pound, making it cost-competitive with aviation-grade graphite fiber.

The company is not alone in its efforts to try to capitalize on the commercial potential of carbon nanotubes.

Made of a single wall of carbon atoms, nanotubes came to widespread scientific attention in 1991. Their commercial prospects were heightened later in the decade when Rick Smalley and colleagues at Rice University developed the first process to produce relatively large batches of the material.

Today, there are about 80 companies trying to manufacture nanotubes on an industrial scale, said Wade Adams, director of the Center for Nanoscale Science and Technology at Rice.

The challenge remains making a batch of pure nanotubes.

Standard processes that make nanotubes contain dozens of variations: single-walled nanotubes and less useful double-walled nanotubes, and differing levels of conductivity and orientations.

The yarns created in Nanocomp's process are about 98 percent pure single-walled nanotubes.

"It's exciting to see this kind of development," Adams said. "If the properties are as good as they're saying they are, it's an important step forward in carbon nanotube development."

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