



NANOTECH, STARTUPS, DEFENSE

## Modumetal Grows Nanotech Metals for Military, Aiming To Make Parts For Your Car

Gregory T. Huang 7/31/08

How would you like to grow your own bulletproof vest? If you're interested, Christina Lomasney can hook you up. OK, the technology might be a bit pricey for civilian use, but talk to soldiers and military leaders and it's a different story. Lomasney's company, Seattle-based [Modumetal](#), is developing a new kind of "nanotech metal" that's stronger and lighter than steel, which makes it a very promising material with which to make advanced armor and transportation parts. And, yes, you can grow it in a vat.

Just last week, Modumetal [announced](#) it has won a two-year contract with the U.S. Defense Logistics Agency to deliver advanced metal parts to be used in military land vehicle and propulsion systems. So I caught up with Lomasney, the co-founder and president, to learn more about her company's technology and strategy.

Modumetal's approach may sound exotic, but it's actually a pretty well-established method in nanotech. The idea is to start with a solution of metal in acid, and put in an electrically conducting rod. By running a current through the rod, you can get the metal alloy to grow onto it in ultra-thin layers (down to a thickness of 1 nanometer, or a billionth of a meter). These materials are called "nanolaminates." The molecular structure of the layers can be adjusted to make the resulting alloy resistant to shattering, resistant to being penetrated or deformed, and lightweight—material properties that usually can't be combined. "How the layers grow is our secret sauce," says Lomasney. "It's like grass growing, you can watch it."

The result? Metals that can be used to make stronger armor—at half the weight of the conventional steel used in military vehicles such as Humvees. Modumetal's method can also yield fully-formed specialized metal parts without the need for complex processing steps like machining. These parts, which can reach several feet in length, can be used in suspensions, jet engines, and turbine disks to make these systems more durable and fuel-efficient, because they can operate at higher temperatures without breaking down.

The company's background holds interesting lessons in entrepreneurship as well. Lomasney studied physics at the University of Washington and worked for Boeing from 1996 to 2000, before co-founding [Isotron](#), a local materials science startup, in 2001. In late 2006, she co-founded Modumetal with her former UW labmate John Whitaker. Acquiring a core patent for making nanolaminates from [Delphi](#), a Troy, MI-based automotive company, they immediately grasped the opportunity. "We were very intrigued," says Lomasney. "We could very quickly produce macroscale parts."

I asked Lomasney how her experience at Boeing helps her in running her own company. "It's a great place to start, and I learned a lot about business practices," she says. "Things like the ways we protect intellectual property, how we capture information. More importantly, ways to organize our projects, and putting in controls necessary to get funding, and rigor in designing experiments."

Funding from the [Alliance of Angels](#) and other investors helped get Modumetal off the ground, and military contracts are helping to sustain it. A year and a half later, the startup has 11 full-time staff and 16 production lines running in parallel at its facility on the North side of Lake Union. It can make a thick plate of armor in a few days, using bathtub-sized tanks of metal solution.

So what's next? "Our strategy is to start with very high-performance military applications," Lomasney says. "We also see the military as a way to transition to the transportation sector." In the next few years, if the technology takes off, look out for nano-metals in cars, boats, and commercial planes—anywhere fuel efficiency is an issue. They might even be grown in a vat near you.

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