



## Cellular Materials International, Inc., Charlottesville, VA

2003–2004 Navy TAP Participant

[www.cellularmaterials.com](http://www.cellularmaterials.com)

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—Harry Burns, CMI president

Cellular Materials International, Inc. (CMI) develops and manufactures proprietary structural materials based on periodic cellular material (PCM) to satisfy commercial and military requirements for lightweight, multi-functional structures that are cost-effective, safe and efficient. Using funding from the Navy's SBIR program, CMI recently developed a lightweight, high strength sandwich panel to help provide protection to Navy and Marine Corps manned platforms from explosively generated impulses.

The company has received nearly \$3.5M for continued R&D, prototyping and live field testing.

Concurrently, the company has generated strong interest from a number of customers interested in the multi-functionality of the material for defense and space applications. According to Harry A. Burns, CMI president, the success of this innovation—and its suitability for diverse applications—lies in the geometry of the material.

Unlike conventional materials, such as honeycomb, CMI sandwich panels utilize a simple, yet innovative core design for groundbreaking strength-to-weight ratios combined with low relative density (typically 95 percent or more open space) to achieve structural strength, the ability to absorb or deflect energy (ballistic or blast), heat management and the availability of space, which can be used for additional functionality (e.g., use as a fuel tank or to hold electro-magnetic devices).

"The fact that our unique core exceeds the strength-to-weight ratio of conventional designs is in and of itself an important development in structural design. But what sets CMI apart is the fact that we have this high ratio of open space which can be customized for a wide variety of applications," explained Burns.

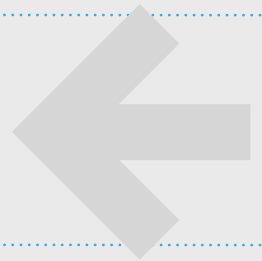
Since the CMI sandwich panels have high structural strength and excellent heat management and heat transfer characteris-

tics, the material has been adopted for a next generation aircraft carrier Jet Blast Deflector (JBD), which allows the deflector to be totally passive rather than needing pumped water for cooling as required by conventional aircraft carrier JBDs. CMI's materials are also uniquely suited for rockets and space re-entry vehicles. CMI's materials are size scalable, fitting applications from 36' x 14' panels down to the size of a very tiny bone implant or stent.

CMI's open space design has led to additional applications. The company has contracts with DARPA and Army Research Lab to develop advanced armor for a variety of threats. "These all relate to the original SBIR, but we've found new ways to build on the core design and create new applications," he said. The initial technology leading to armor has great significance, as the company is urgently building prototypes to be developed and tested for use in Iraq.

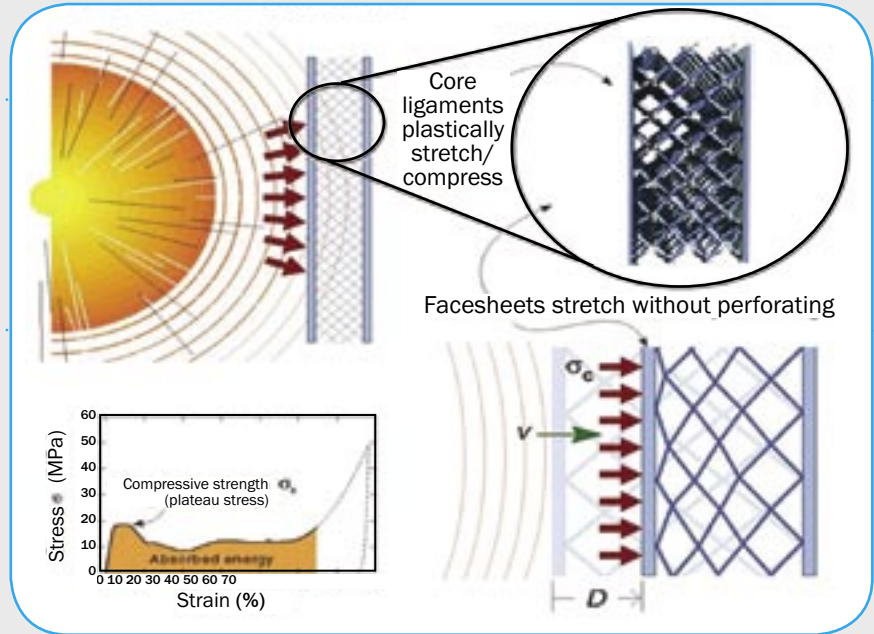
Dr. Steve Fishman, at ONR, recognized the value of the technology from the beginning. He became a champion and was instrumental to CMI's Phase III success. According to Burns, support from ONR has been instrumental in the company's success. Over the last year, both CMI and its sister company, DVTI, have experienced very strong growth, increasing employment to more than 24 employees and establishing two new facilities in its hometown of Charlottesville, Va.

Burns believes innovative technology that meets multi-functional needs, coupled with strong credibility, are key factors to their success. "I want to emphasize the importance of developing credibility as a key factor for our success. We've found it critical in developing relationships with the primes and the program managers, including the program managers at the defense labs," he said. "Credibility and quality of product are the keys, and in addition the company has an obligation to look forward and understand what the next steps are to the program, not to wait



**Company Success: Nearly \$3.5 million in follow-on research and development**

An example of how Cellular Materials International's ultra-light, high-strength sandwich panel helps the Navy and Marine Corps protect their manned platforms from explosively generated impulses.



for the program to come to the company. It's not just about the execution, it's about the planning. You've got to think a few steps ahead, help the program managers develop the next steps and then promote the next steps," Burns stressed.

Burns credited the Navy SBIR program and the TAP for contributing notably to the successful development of CMI. "The emphasis in the SBIR program on commercialization is extremely important. In addition, TAP was helpful in focusing our understanding and helping us communicate our capabilities and describe our business much better. With an emphasis on commercialization planning, TAP also made sure that we understood the system and were focused on paths to transition, not only with the programs but the primes." He continued, "TAP led us to have a number of meetings with various primes and it helped in establishing a network of contacts with the primes that we believe will turn into significant business for us."

As CMI looks into the future, it sees its multi-functional, versatile technology not only being highly valuable to the defense and aerospace industry but being applied to the medical, commercial building and personal computer industry—"really any industry that seeks a strong, lightweight material that offers performance at a lower cost," Burns concluded.



**We've developed unique, lightweight sandwich panels which exceed the strength to weight ratio of conventional designs, have the ability to absorb energy and have excellent heat transfer and management capabilities.**

—Harry Burns, CMI president