

**Testimony by:**

**Anthony C. Mulligan**

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**Hearing on Small Business Innovative Technologies and Research**

**House Armed Services Subcommittee on Tactical Air and Land Forces**

**July 21, 2004**

Chairman Weldon, Ranking Member Abercrombie, and members of the House Armed Services Subcommittee on Tactical Air and Land Forces, thank you for inviting me to testify before you here today at your hearing on small business innovative technologies and research.

My name is Anthony C. Mulligan and I am the CEO of Advanced Ceramics Research, Inc., (ACR), of Tucson, Arizona. ACR is a successful small high technology company that through the support of the Department of Defense, and other Federal agencies, primarily the Office of Naval Research and DARPA small business research programs, have developed a family of new enabling technologies for manufacturing processes. These processes are already demonstrating a cost savings for a broad range of military weapon systems, ultimately benefiting our troops in the field as well as American taxpayers.

Through the SBIR program ACR has developed multiple manufacturing process technologies including a NAVAIR funded SBIR technology called Water Soluble Tooling (WSS), a DARPA technology called Extrusion Free Form Fabrication (EFF), and an ONR technology called Solid Free Forming (SFF).

ACR's Water Soluble Tooling has demonstrated tremendous cost savings over traditional metal for a number of applications. In one case, ACR manufactured the tooling for a large carbon composite component for a cost of approximately \$15,000. The customer who was a larger Defense Prime Contractor stated that comparable metal tooling would have cost over \$1 million dollars to fabricate. In a second case, ACR fabricated tooling for about \$5,000 which replaced traditional metal tooling costing nearly \$150,000. In addition to Navy needs for fighter aircraft, numerous applications have been identified in other military systems and the commercial sector. Customers include Lockheed, Alliant Techsystems, Boeing, Aero-Consultants, Cabo Yachts, BF Goodrich, Ferrari Automotive, Motorola Cell Phones, and Cardio West, which manufactures artificial hearts. Our Aquacore and Aquacast products developed in this program were recipients of the 2001 R&D 100 award. The Water Soluble Tooling NAVAIR SBIR program is now

transitioning to a Phase III Indefinite Deliverable / Indefinite Quantity contract.

Combining the Water Soluble Tooling Technology with the earlier mentioned manufacturing technologies will enable the automated production of systems such as an Unmanned Air Vehicle (UAV) structural airframe made in a single piece. This technology can also be applied to low cost, high performance, one piece composite Unmanned Underwater Vehicles (UUV's) and other complex weapon systems such as a one piece composite missile casing. The technology is also applicable to building a new generation of one piece rocket motors and even small turbine engines.

Courtesy of:

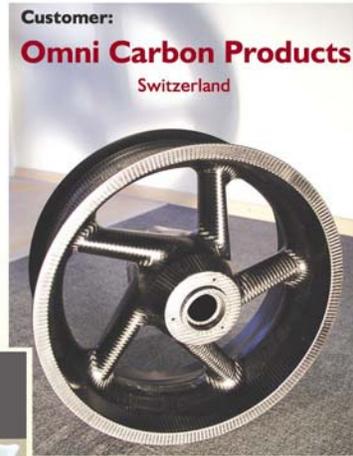
**Aero Consultants Ltd.**

Switzerland

Example of a two-piece mandrel created with Aquapour™ and bonded with Aquafill™. Final OCP piece was sealed with Aquaseal™ (demonstration piece was sealed with laquer seal for better protection during shipment).

**Part Specifications:**

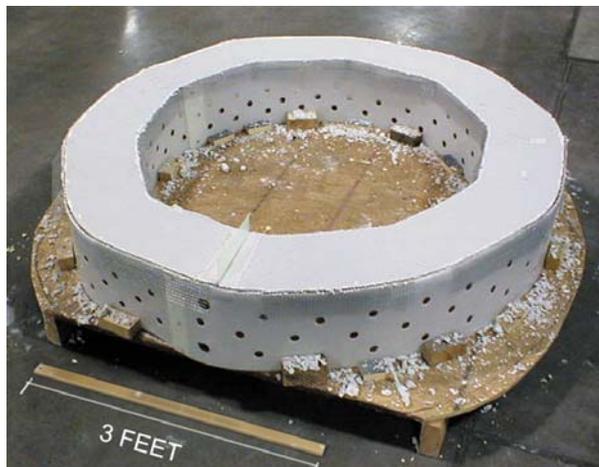
- Silicone Mold Used With Fiberglass
- Aquapour™ is Stamped to Form the Hollow Mandrel
- 10mm Wall Thickness



Customer:

**Omni Carbon Products**

Switzerland



**Aquacore™ Water Soluble Composite Tooling**



**Artificial Heart Tooling**

ACR is just one example of the small businesses that are succeeding through the congressionally mandated small business innovative research program (SBIR). I believe Congress established the SBIR program because it recognizes that small business creates most of the new jobs, and is the source of most innovation. This is simply because small businesses are not risk adverse, we have no choice. In order to stay competitive in today's business climate we must take risks. Our current times demand that the Department of Defense be willing to take more risks by investing in successful small businesses. I believe that the members of this subcommittee could assist the Department by providing adequate support personnel to the offices administering the SBIR funds, encourage expanded use of Indefinite Deliverable / Indefinite Quantity contracts for SBIR programs, and remove disincentives which deter the acquisition community from dealing with small businesses.

Again I appreciate the opportunity to testify, and I would be glad to answer any questions members may have.