

Air Force

SBIR

# Impact



## New "Nanocomposite" Materials Offer Significant Advantages For Air Force Technology Development

**Company:**

Triton Systems, Inc.

**Location:**

Chelmsford, MA

**Employees:**

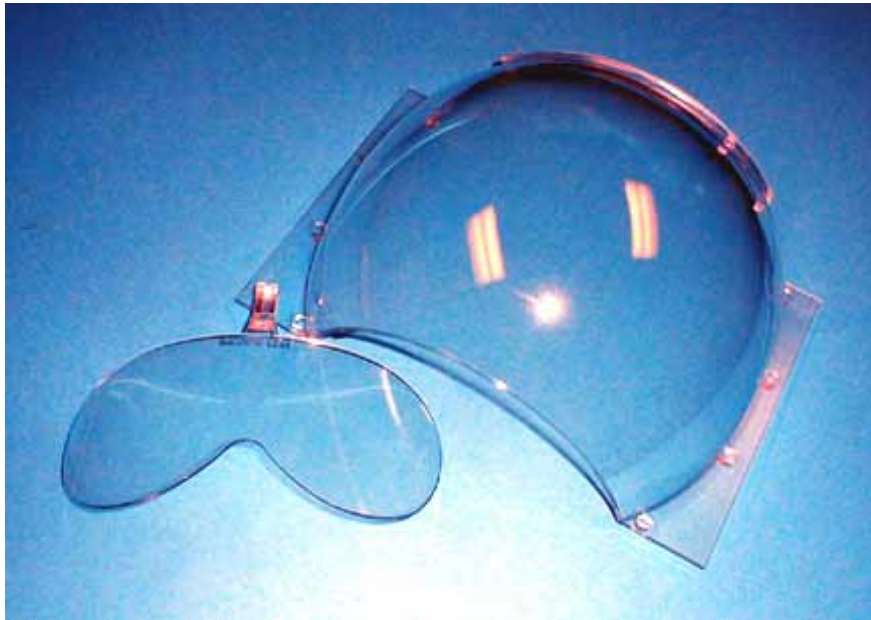
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**CEO:**

Ross R. Haghighat

**Project Officer:**

Jeff Baur, Ph. D.  
AFRL Materials &  
Manufacturing Directorate  
Wright-Patterson AFB, OH



**Highly scratch-resistant goggles**

**Air Force Requirements:**

The Air Force is constantly searching for cutting edge materials for its next generation aircraft. Strength and insulation are often at odds with weight and cost with new materials. Any small advantage in these trade-offs can be important in the extreme environment of aerospace.

**SBIR Technology:**

Using Air Force SBIR Phase I and II contracts, Triton chemists mixed nanometer-sized ( $1 \times 10^{-9}$  meter) particles of specially modified silicates with conventional polymers to develop a class of materials that produce significant property improvements with just a small percentage addition of tiny silicate particles. With this addition these "nanocomposites" outperform conventional polymers by two to four times in:

- Barrier (resistance to leakage in or out)
- Impact resistance
- Flame resistance
- Thermo-mechanical properties (strength at high temperatures).

**For more information on this story, contact Air Force TechConnect at 1-800-203-6451 or at [www.afrl.af.mil/techconn/index.htm](http://www.afrl.af.mil/techconn/index.htm)**

### Company Impact:

Triton has already demonstrated applications for this new class of materials in such innovative areas as ablative rocket motor casings, highly scratch-resistant aviator goggles, and long field-life food containers. Other diverse commercial applications for nanocomposites include replacement of "filled" and structural components in automobiles and upgrading of conventional fiber composites for packaging. Significantly, Triton was able to take the concept to product prototype in eighteen months, an extremely rapid development cycle for a new class of materials.

Triton looked to the commercial markets for similar applications of its SBIR developed technology. A major athletic footwear manufacturer needed a technology so the cushioning sole would not lose its pressure over time. In an athletic shoe, helium filled capsules can be used to provide greater cushioning and shock absorption than conventional shoes. The same "barrier" properties that keep the freshness in a food package also contain the cushioning gas.

Today, Triton's ORMLAS™ brand of high barrier plastic and its NanoTuf™ chemical and scratch resistant coatings are core to the company's success. The cushioning pouch alone enabled the manufacturer to launch a new line of footwear with a retail value in excess of \$250 million. The business value to Triton will be several million dollars. Triton is also using SBIR Phase II and III support from the Air Force with further contracts from the Army and Navy to improve the quality of protective eyewear for the warfighter.

### Company Quote:

"The Air Force's early commitment to the promise of nanocomposites was critical to Triton's success in the field. We are on the threshold of a new generation of materials with great implications for both aerospace and commercial markets."

Ross R. Haghghat  
Chief Executive Officer  
Triton Systems, Inc.

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