



Innovating for the  
Next Generation Warfighter

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The next generation warfighter relies on new technologies and advanced manufacturing solutions that are agile, flexible, and reliable. Composite Based Additive Manufacturing (CBAM) from Impossible Objects redefines material capabilities and opens new doors to advanced applications for hypersonics, conductive traces, smart parts and more. Powered by several strategic partnerships with military and research organizations, Impossible Objects is advancing the warfighter and identifying applications that provide tactical advantages.

Impossible Object's CBAM technology combines the production rate of conventional manufacturing with the design flexibility of 3D printing to create high performance materials at break neck speeds. These advanced composite materials are lightweight, strong and ideal for aluminum replacement parts on legacy systems. By removing the barriers, we've unlocked new opportunities to reshape and **rethink manufacturing**.



## Understanding Composite Based Additive Manufacturing (CBAM)

Next generation manufacturing begins with innovation. Composite based additive manufacturing (CBAM) from Impossible Objects produces strong, lightweight materials needed for prototyping, production, and quick tooling solutions. The combination of carbon fiber, glass filled, nylon12 and PEEK materials creates a matrix of unique and highly capable parts needed for a variety of applications.



High Strength  
>140 MPa



High Heat Performance  
MP 300° C



ESD Safe



High Chemical  
Resistance

## Developing for the Future of Sustainment

Impossible Objects addresses current and future advanced manufacturing requirements for the aerospace and defense industry. Below is an introduction to several research and development projects with various military and research organizations located across the globe.

### Current Innovation Projects



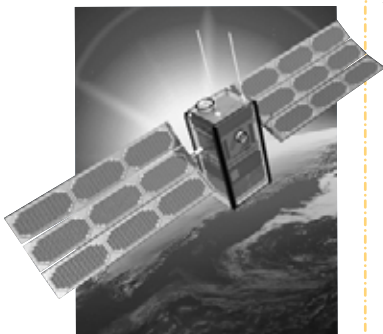
**Ceramics for Hypersonics** - Hypersonic weapons are highly maneuverable and capable of traveling at Mach 5 speeds. Powered by unique engine designs, these vehicles and missiles are engineered to evade most defense systems currently operational in today's military. The increasing need for this type of technology leads to new advances in ceramics manufacturing due to the resistance of friction burn and high temperature capabilities. Impossible Objects is collaborating with a leading US Department of Energy research facility to print advanced ceramic composites for hypersonic weapons.



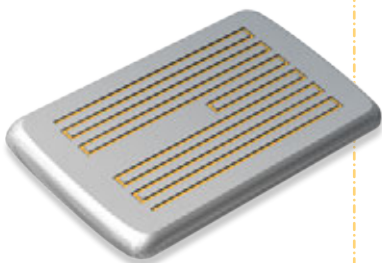
**High Strength Uniaxial Parts** - Carbon Fiber (CF) PEEK is a high performance composite with excellent mechanical strength and dimensional stability properties, only printable on Impossible Objects CBAM. The Air Force Research Lab (AFRL) is currently utilizing this material to produce legacy part replacements for a variety of applications. The high strength uniaxial parts from Impossible Objects have either identical or better properties than existing parts. It's an important step towards sustainment improvement in the DOD.

### Are you interested to partner on projects?

Learn more at [www.impossible-objects.com/industry-military](http://www.impossible-objects.com/industry-military)



**CubeSat Devices** - The battleground is expanding beyond our atmosphere, forcing satellite development companies to innovate faster than ever before. The military is adapting the use of cubesats to improve battlefield communications. Impossible Objects is in development of several cubesat devices that are ESD safe, lightweight and stronger than what exists today.



**Conductive Traces and Embedded Electronics** - There is an arms race in the additive manufacturing sector to 3D print conductive traces for a variety of applications. It's no secret that this type of capability would revolutionize part design and assembly for electronic products and components. Historically, the challenge has been conductivity and uniformity. By partnering with the US Air Force, Impossible Objects is developing a new method to print conductive traces and establishing guidelines for embedded electronics. This paves a path towards smart products with predictive product health monitoring systems.

# **RETHINK MANUFACTURING**

*[www.impossible-objects.com](http://www.impossible-objects.com)*

Impossible Objects HQ • 3455 Commercial Avenue • Northbrook, Illinois 60062 • 847.400.9582  
Rochester Location • 3495 Winton Place • Building B, Suite 2 • Rochester, NY 14623 • 585.542.2130