



## MATECH Announces Breakthrough Ultra-High-Density Carbon-Carbon Composites for Hypersonics.

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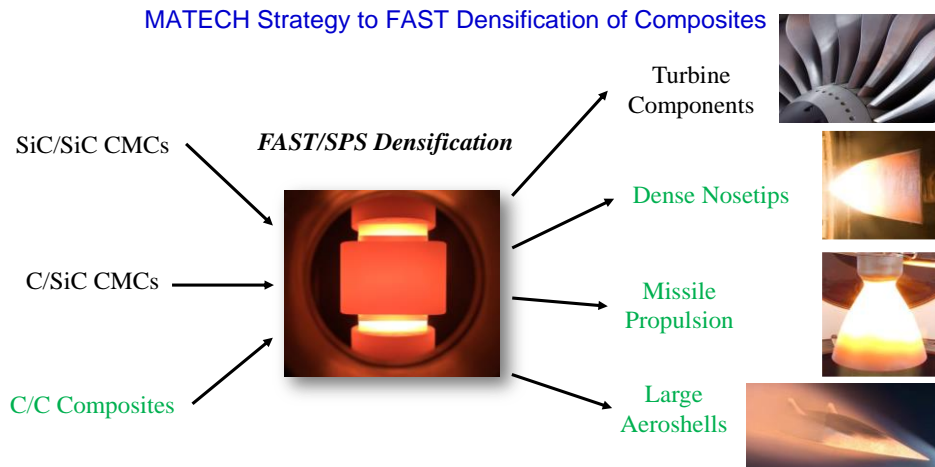
(Westlake Village, CA, January 10, 2024) – MATECH announces the creation of ultra-high-density (UHD) carbon-carbon composites. This breakthrough new technology will enable carbon-carbon composites with an ablation and oxidation resistance 20 times greater than “off the shelf” carbon-carbon composites today. Applications include nose tips and leading edge components for demanding hypersonic missile applications and ballistic reentry.

MATECH will formally announce, for the first time publicly, this patent-pending development on Tuesday, January 23, 2024, at the 47th Annual Composites, Materials & Structures (CMS) Conference in St. Augustine, Florida. MATECH’s field assisted sintering technology (FAST) densified carbon-carbon composites achieves ultra-high densities not previously demonstrated.

By MATECH’s new process, carbon-carbon composite bulk densities in excess of 2.20 g/cc have now been demonstrated, approaching the absolute theoretical density of graphite (2.26 g/cc). In addition, extensive fiber pull-out upon fracture has been documented. FAST carbon-carbon composites are readily scale-able to nose tips and leading edge components for demanding hypersonic missile applications. In addition, the process is safe, inexpensive, and relatively easy. This Patent Pending technology extends MATECH’s prior work on the FAST densification of SiC/SiC and C/SiC CMCs (US Patents 10,464,849 and 10,774,007).

High Density Carbon-Carbon (HDCC) composites were originally pioneered for ballistic re-entry nose tips in the 1960’s and 1970’s. Using the “Hot Isostatic Pressure Impregnation Carbonization” (HIPIC) process, High Density Carbon-Carbon (HDCC) replaced dense monolithic graphite. Unfortunately, HIPIC is dangerous, expensive, and difficult. Nonetheless, bulk densities of 1.95 g/cc were routinely produced. Until now, no other process could achieve significantly higher densities for carbon-carbon composites.

MATECH was founded in 1989 by Edward J. A. Pope, Ph.D. MATECH is recognized for world-class research and development in the areas of glass, ceramic, and high temperature ceramic composite materials. Dr. Pope is an internationally recognized leader in high temperature and ultra-high-temperature (UHT) materials. Dr. Pope also has 19 issued US Patents and more pending.



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