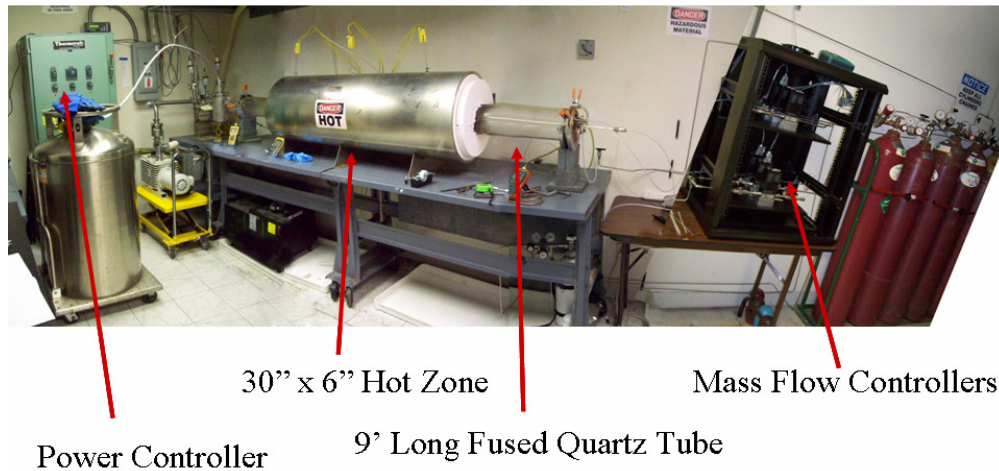


# MATECH

## MATECH Commissions New “State of the Art” CVI/CVD Lab

MATECH spent about nine (9) months building a fully functional large R&D level CVI/CVD laboratory. The system became fully operational in September, 2010. In Figure 1 below, a “panoramic” view of this newly operational system is shown. It has a very large hot zone for processing numerous small fiber preforms simultaneously or one really big part. The system has six (6) independent mass flow controllers, thus enabling multiple compositions of interface coatings, passivation layers, and CVI matrices to be processed without having to remove the parts from the CVI furnace and risk contamination. In Figure 2, the most promising capabilities are enumerated.

“Panorama” View



**Figure 1: “Panoramic” View of MATECH’s In-House CVI/CVD Facility (Operational in August, 2010).**

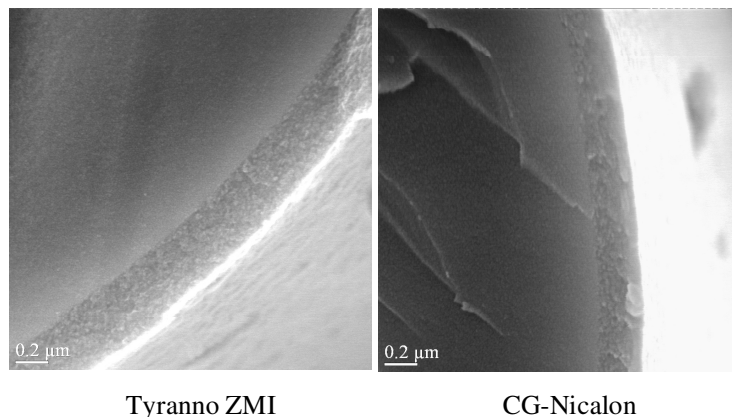
- CVI Interface Coatings:
  - BN
  - PyC (Pyrolytic Carbon) and PyC/SiC (bilayer)
  - BN/SiC (bi-layer)
  - BN/Si<sub>3</sub>N<sub>4</sub> (bi-layer)
- CVI Densification:
  - Carbon
  - SiC
- CVD EBC Coatings:
  - SiC, HfC, ZrC, Si<sub>3</sub>N<sub>4</sub>, and various oxides.

**Figure 2: MATECH’s CVI Interface Coatings, Matrices, and EBC Capabilities.**

The first demonstration of the CVI/CVD capability at MATECH was conducted by depositing a 400 nm thick interface coating of BN in various SiC and carbon-based fabrics. In Figure 3, the iridescent coatings on the CG-Nicalon (SiC) and T300 (carbon) preforms is shown. This iridescence is an excellent sign. In Figure 4, the BN interface coating microstructure is shown using field emission (FE) scanning electron microscopy (SEM). This high resolution microscopy was performed at Teledyne Scientific (Thousand Oaks, CA). Teledyne Scientific is the new name and identity for what was once known as the “Rockwell International Science Center.” These micrographs show “textbook” BN interface coating deposition. For this program, The TaC fiber tows/preforms will be coated with a pyrolytic carbon (PyC) interface coating, prior to TaC matrix densification.



**Figure 3: BN Coating on CG-Nicalon Fabric on T300 Fabric (underneath).**



**Figure 4: MATECH CVI BN Coatings on Selected SiC Ceramic Fibers.**

Recently, MATECH has demonstrated PyC interface coatings on a variety of preform (carbon fiber and SiC fiber). MATECH has also CVD coated C/ZrOC CMCs

with dense, nanocrystalline SiC EBC coatings. Additional capabilities include CVI SiC matrix CMCs and silicon nitride matrix CMCs.

**For more information, contact:**

Edward J. A. Pope, Ph.D.  
Chairman/CEO

818.991.8500 x1001  
e-mail: [ed@matechgsm.com](mailto:ed@matechgsm.com)

MATECH Global Strategic Materials, Inc.  
31304 Via Colinas, Suite 102  
Westlake Village, CA 91362  
fax: 818.991.4134  
URL: [www.matechgsm.com](http://www.matechgsm.com)