

Florida International University

Wall of Wind Testing Facility (WoW)

Website: <http://wow.fiu.edu>

Contact Information

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Description

The 12-fan Wall of Wind (WoW) at FIU is the largest and most powerful university research facility of its kind and is capable of simulating a Category 5 hurricane – the highest rating on the Saffir-Simpson Hurricane Wind Scale. For more than a decade, FIU researchers and engineers have planned, designed and redesigned numerous concepts and models that have all contributed to the science and technology behind this state-of-the-art machine.

Due to increased demand for higher wind speed testing, FIU has taken yet another step forward with its 12-fan WoW. The new system is capable of performing controlled and repeatable to-scale testing in flows that replicate the type of CAT 5 level winds seen during Hurricane Andrew – one of the costliest storms in US history. This facility will not only fill the void where most current win-structure experiments fail, it has the potential to be as influential to wind engineering as crash testing is to the automobile industry.

FIU brings together the critical elements of wind testing to achieve comprehensive results for its clients. To do this, an expert team of wind engineers and scientific researchers integrates the unique capabilities of the Wall of Wind and the Titan America Structures Lab with the analytical tools of Computational Fluid Dynamics (CFD) simulation. At the WoW, tests can be described by three categories: 1) non-destructive (aerodynamic), 2) destructive (failure) and 3) wind-driven rain. For the non-destructive tests, a comprehensive instrument inventory is available to capture data of wind-induced forces, moments, strains, pressures, displacements, among others.

Fee Schedule

To be determined by the scope of work.

Advanced Materials and Engineering Research Institute (AMERI)

Web Site Link: <http://ameri.fiu.edu/home/About.html>

Contact Information

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Description

The Advanced Materials Engineering Research Institute (AMERI) provides an open access equipment infrastructure to support materials research and engineering over a broad range of technology and capabilities. The Institute provides analytical instrumentation, materials characterization, and process development laboratories to support faculty and industry in the development and characterization of new materials over the continuum from the nanoscale to bulk materials.

The Analytical Instrumentation Laboratory contains a field emission scanning electron microscope (FESEM), a 200 keV Transmission Electron Microscope (TEM), Atomic Force Microscope (AFM), X-ray diffraction, thermal (DSC, TGA, DMA, dilatometer flush diffusion, and mechanical testing (uniaxial/biaxial Instron, creep). Process Development laboratories for ceramic processing (sol-gel, tape casting, milling), polymer processing, metal processing, and arc melting, thermal processing (air, vacuum, hydrogen, controlled atmosphere furnaces) are available to support faculty and student researchers.

The Institute contains the Motorola Nanofabrication Research Facilities, which is supported by a class 100 clean room and nanofabrication capabilities including e-beam lithography and optical photolithography. Fabrication of nano/micro electromechanical systems (N/MEMS) can be accomplished by a combination of nanolithography, reactive ion etching, and thin film deposition by a variety of techniques (e-beam, sputtering, filament evaporation, cvd).

In addition to supporting research within the graduate program in materials science within the Department of Mechanical and Materials Engineering, the Institute supports faculty across all departments (physics, chemistry, geology, biology) in materials based research.

Fee Schedule:

Please visit AMERI website <http://ameri.fiu.edu/>

Plasma Spray Forming Laboratory

Web Site Link: <http://web.eng.fiu.edu/agarwala/laboratories/PlasmaFormingLab.html>

Contact Information

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Description

This lab makes use of plasma-based techniques to synthesize:

- Near Net Shape Structures by Rapid Prototyping
- Bulk Nanostructured Components
- Advanced Ceramic and Metallic Nanocomposites
- Multilayered Functional Coatings
- Synthesis of Nanostructured Composite Powders

[Click Here for Demo](#)



Plasma Spray Forming Laboratory is a 1300 square feet facility. The equipment list is given below:

- Praxair Plasma Spray System
- Plasma Power Source Model PS-1000
- Plasma Control Console Model 3710
- Powder Feeder Model 1264
- Plasma Spray Gun Model SG-100 (internal and external powder injection capability)
- Localized inert shroud creating facility
- Plasma Spray Booth with CNC turntable
- Fanuc S 100 Robot with RF controller
- Three-axis Gantry Robot
- Thermach AT-1200 Powder Feeder, 0-15 RPM
- Accuraspray-g3 Single Head Plasma Inflight Sensor
- Raytek Optical Pyrometer (-10 to 1200C) with integrated software and PC for continuous temperature monitoring
- 4-channel B-Type (0 to 1700C) and K-Type (-200 to 1250C) Thermocouple with OM-CP-QUADTEMP Data Acquisition System and OM-CP-IFC110 Windows Software
- Grit Blaster
- Ultrasonic Cleaning Bath
- Density Measurement Kit
- ER Advanced Ceramics 755RMV Jar Mill
- Sieves and Sieve Shaker
- Work Bench with all machine tools
- Rotating Ball Mills and blenders
- Low Speed and High Speed Diamond Saws
- Positron Adhesion Tester
- Optical Microscope (upto 1600X)
- Electrostatic Spray Facility for Polymer Coating Synthesis



Computational Facilities in Plasma Forming Laboratory:

- 2 Pentium IV, 3.40 GHz, 2 GB RAM desk top computer
- 3 Pentium IV, 2.6 GHz desk top computers
- 1 Pentium IV, 2 GHz notebook computer
- 2 Pentium IV, 3.20 GHz, 3.5 GB RAM desk top computer
- Software in Plasma Forming Laboratory
- CaRIne Crystallography 4.0: For geometric visualizations of interfaces, surfaces, crystals, real lattices in 3D, reciprocal lattices in 3D and 2D and for comprehending stereographic projections and X-ray diffraction patterns.
- FactSage 6.0: A thermochemical software and database package to understand phase diagrams, feasibility of chemical reactions, compel equilibrium in multicomponent, and multiphase systems.
- Hyper Chem 7.5: Modeling software to compute thermodynamic energies based of molecular mechanics and dynamics models for various configurations and crystal geometry.
- SimDrop 3.0 software: For simulating splat formation with thermal and kinetic history as experienced in thermal spraying.

Fee Schedule:

Please contact Prof. Agarwal at agarwala@fiu.edu