MESOSCRIBE TECHNOLOGIES

SBIR/STTR Grants & Contracts: A Small Business Perspective

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CEO

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Disclaimer: The content and opinions expressed in this briefing are not those of the US Government nor SB-SBDC but solely reflect the views of J.Brogan.

Content

- About MesoScribe Technologies
- Our technology: Direct Write printing
- Our experience with the SBIR/STTR program
  - ✧ Why we chose this route
  - ✧ Our successes
  - ✧ Lessons learned
- Your questions!

About MesoScribe Technologies

- High technology company, founded in 2002
- Spin-off from Stony Brook University, 4 exclusive patent licenses
- Provider of Direct Write products and materials printing services for aerospace, energy, and military markets

Formerly located at the Long Island High Technology Incubator at SBU (LIHTI)

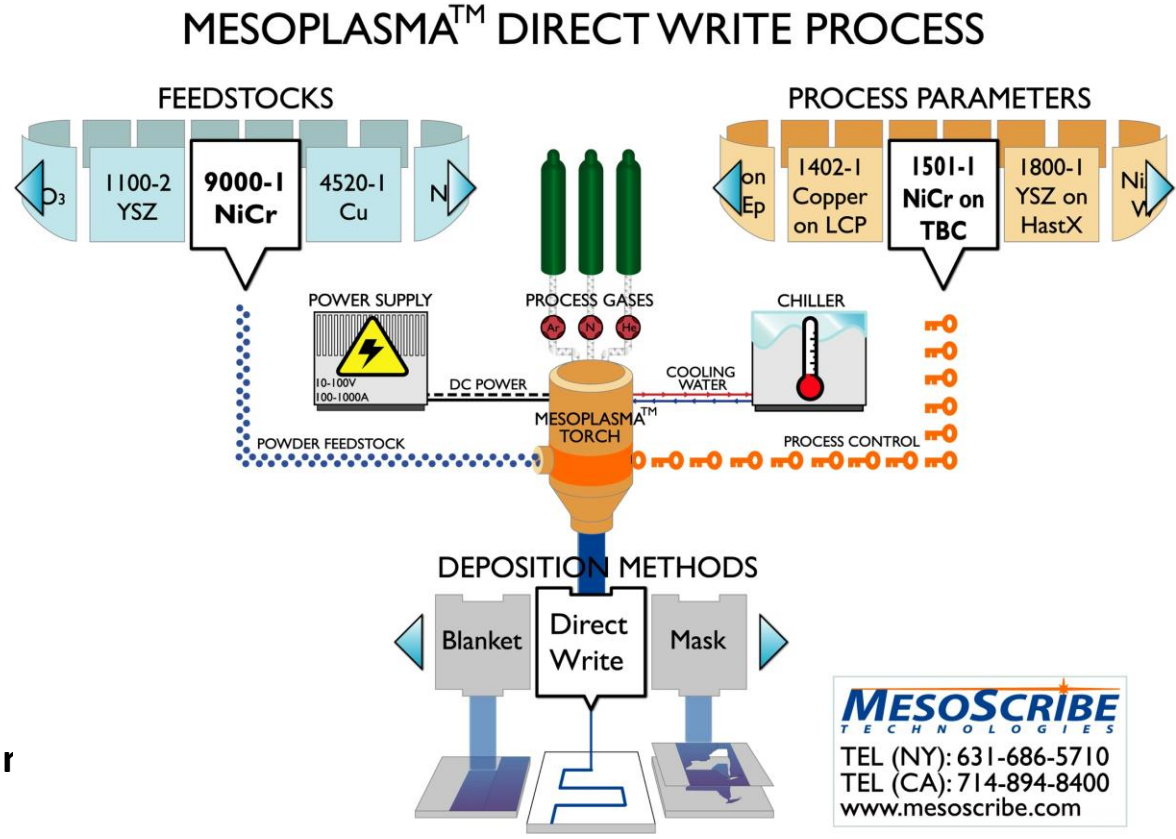
CORPORATE OFFICE
MesoScribe Technologies, Inc.
7 Flowerfield, Suite 28
St. James, NY 11780

MANUFACTURING
MesoScribe Technologies, Inc.
5445 Oceanus Drive #108
Huntington Beach, CA 92649

MesoPlasma™ Direct Write Processing

3D Printing Technology

Direct Write Thermal Spray allows sensors, antennas, and integrated wirir on components or embedded within structures.

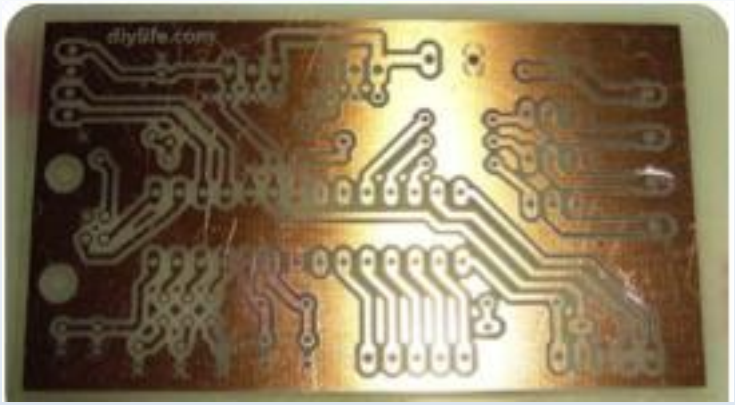


U.S. Patent No. 6,576,861

- Patented hardware and proprietary technology enables **fine feature thermal spray deposition, without masking**
- **Production-proven**, currently used in sensor manufacturing

Benefits of Direct Write Fabrication

- **Traditional Electronics** – Plate all surface with 1 material then remove unwanted material.



- ✧ Flat, stiff substrates (occasionally flexible),
- ✧ Limited materials, copper only
- ✧ Requires masking and hazardous etching materials

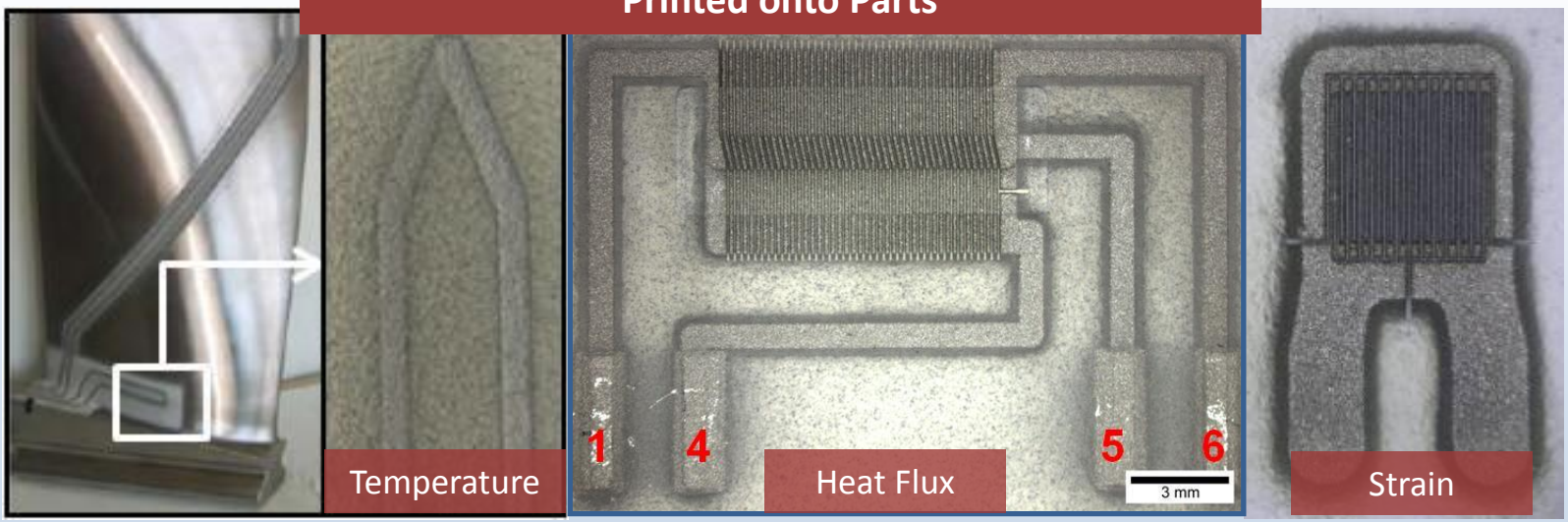
- **Direct-Write Electronics -** Deposit only the material needed where it is needed.

- ✧ Complex, curved parts of most any material
- ✧ Many material choices (metals, alloys, semiconductors, ceramics)
- ✧ No masking, no etching, and in many cases, no post processing needed

Our Products Were Developed with SBIR/STTR Funding

Diagnostic Sensors enabling "*Smart Components*"

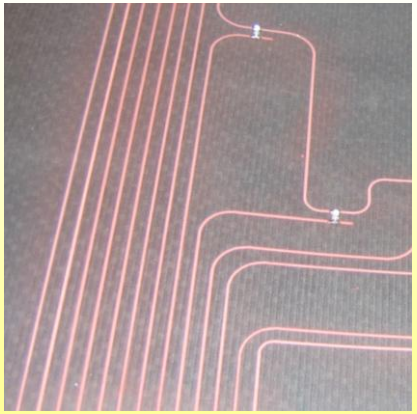
Printed onto Parts



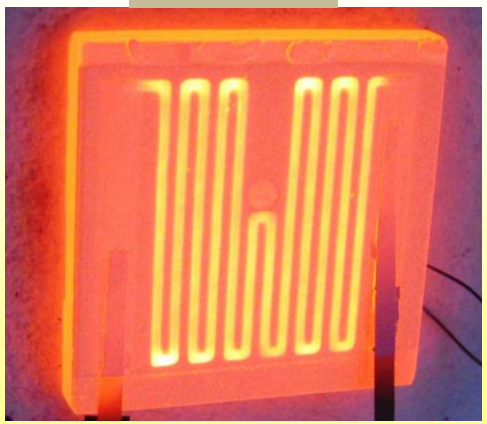
Stand-Alone Sensors

Heat Flux

Copper Wiring



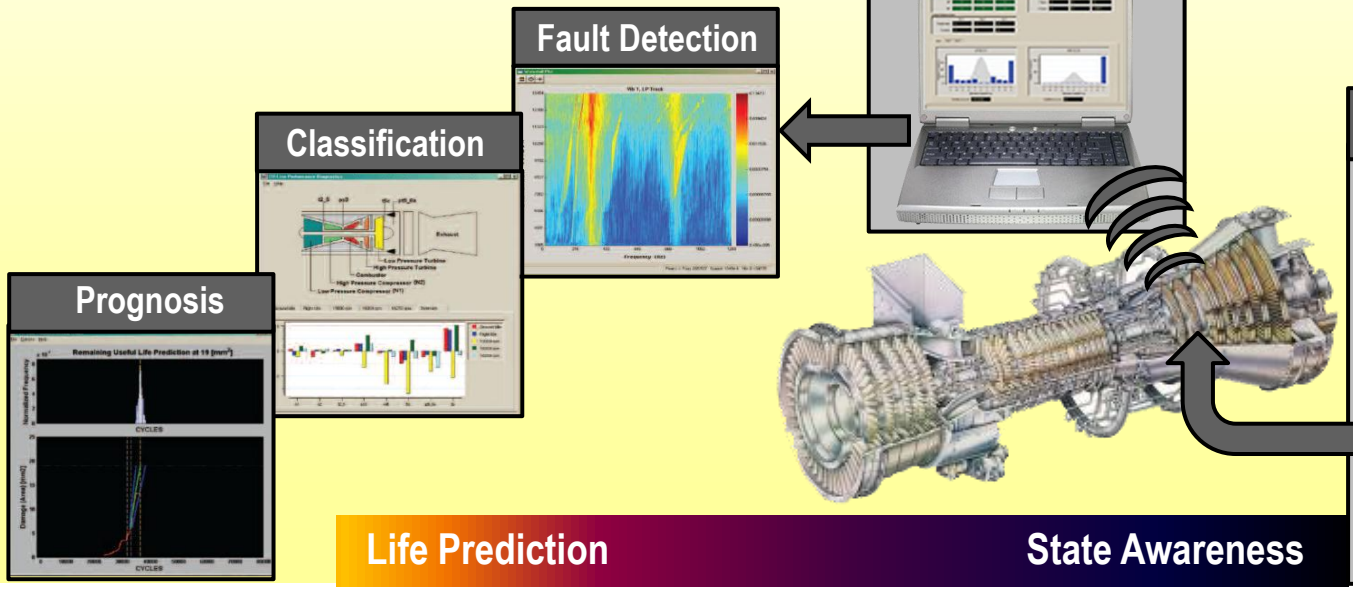
Heaters



Conformal Antennas

Direct Write Instrumentation

- Sensors are **printed onto gas turbine hardware** with robotics to ensure placement accuracy and repeatability
- Feasibility demonstrated through DOE Ph I & II SBIRs
- Sensors are **low profile** and monitor part temperature, heat flux, and strain:
  - ✧ Support real-time diagnostics
  - ✧ Proactive maintenance scheduling
  - ✧ Quantitative part life predictions



Integrated Diagnostics

***Instrumented Siemens Energy blade with sensors**

*NIST ATP Grant Number 70NANB4H3042

Siemens – MesoScribe JV NIST ATP Award

- $5.4M Award enabled by our DOE SBIR Funding

Project Brief

Open Competition 1 - Information Technology

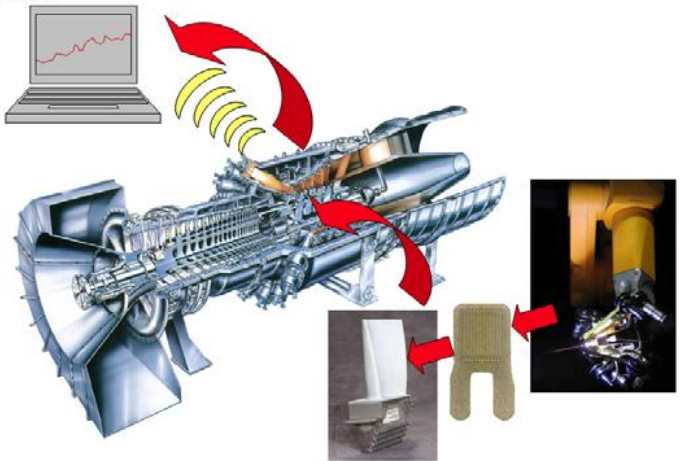
Conformal Direct-Write-Technology-Enabled, Wireless, Smart Turbine Components

Develop embedded sensors capable of withstanding harsh environments and integrate them in a wireless telemetry system to enable thermal, mechanical and wear sensing in operating gas turbines for condition-based maintenance.

Sponsor: Siemens Westinghouse Power Corporation

4400 Alafaya Trail
Orlando, FL 32826

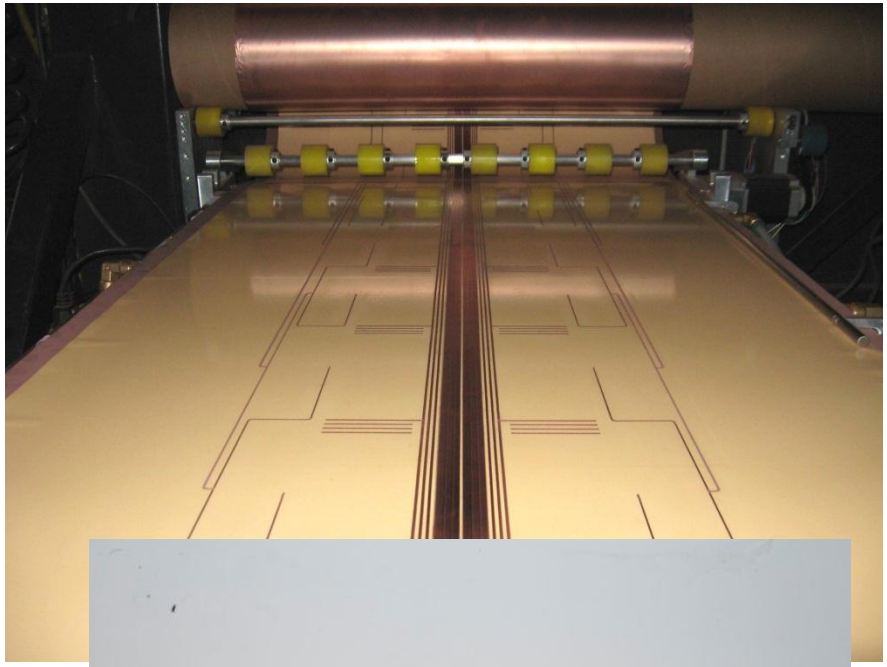
- Project Performance Period: 11/1/2004 - 1/31/2008
- Total project (est.): $5,414,986.00
- Requested ATP funds: $2,653,344.00



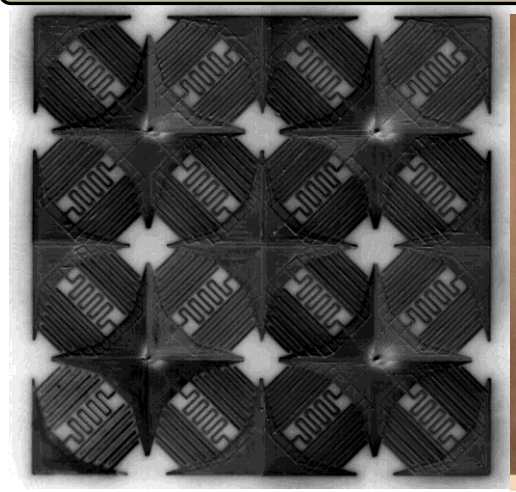
NASA SBIR Funding: Large Aperture, Flexible Antennas

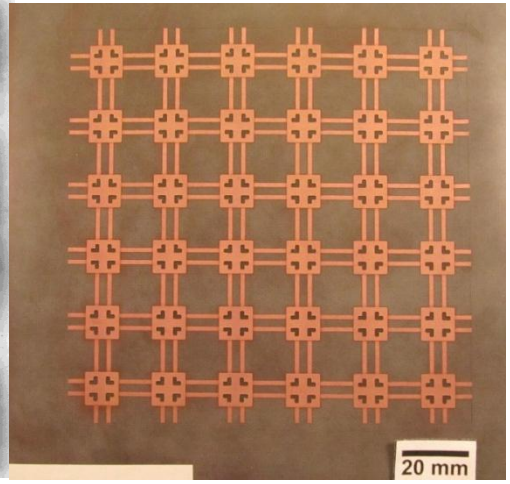
ROLL-TO-ROLL ANTENNA FABRICATION

- MesoScribe has developed **a roll-to-roll deposition process** to fabricate antennas onto polymer laminates
  - ✓ Kapton™, LCP, Tedlar™
  - ✓ No length limitation
- Application for space-based L-band, unfurlable antennas, airships, etc.



Frequency Selective Surfaces





We transitioned the NASA SBIR funded technology to a completely different application for commercial aircraft

DW technology – from idea to airplane in under 3 years!

MesoScribe provides Direct Write sensors to a major aircraft manufacturer for use on a production aircraft currently approved for delivery to customers

- ❑ Implemented an aerospace quality management system (AS9003)
- ❑ FAA approved manufacturing process
- ❑ Production volume manufacturing, fulfilled > 50 orders to date

Our Government Contracting Experience

- Total of 58 grants and contracts to date, > $18.5M
- Received 45 SBIR/STTR Awards (28 Ph I and 17 Ph II)
  - ✧ Department of Energy
  - ✧ Department of Defense (Air Force, Army, Navy, DARPA, MDA)
  - ✧ NASA
- Why didn't we convert all Ph I's into a Ph II?
  - ✧ Change in Acquisition Program / Program Office Priorities
  - ✧ Federal Funding cuts
  - ✧ We were simply beat out by another contractor (technically and commercialization potential)

Government Customers & Sponsors

Our SBIR/STTR Funding

- Launched MesoScribe, enabled gradual expansion
  - ✧ 500 sf increase per year at LIHTI
  - ✧ 1-2 new employees per year
  - ✧ We needed time to develop technology, products, & applications
- Enabled the purchase of laboratory facilities, test equipment, instrumentation, robotics, etc. for 14,000 sf (Direct Costs & on OH)
- Allows you to retain patent rights (FAR 52.227-11)
- Provides 4 years of data rights per contract (Ph I, Ph II, each Ph III)
- No loss of equity, not a loan, nothing to pay back
- No cost share required
- Developed our core technology and created specific products
- Positioned us to attract OEMs/Prime Contractors as partners
- Enabled us to receive non-SBIR follow on funding

A Few Tips….

- Work with a Business Development Center. Understand how you will create a profitable business with your idea. Participate in entrepreneurship boot camps & workshops.
  - ✧ Commercialization strategy is critical, even as you develop your Ph I proposal
  - ✧ A really good idea doesn't cut it anymore, you need a strategic plan
- Engage a commercial partner/customer….
- Minimize your expenses and keep your overhead low.
  - ✧ Stretch the cash (we benefited from No Cost Time Extensions)
  - ✧ Utilize New York State SPIR resources at SUNY if collaborating. We received >$200k in labor, facility usage, etc.
- Carefully manage expectations and adoption of required procedures as a government contractor
  - ✧ Proper government cost accounting system is needed ASAP from Day 1
  - ✧ You need to be compliant and satisfy DCMA/DCAA regulations but large cookie-cutter plans could suffocate your fledgling business

SBIR/STTR awards are a great way to launch a business and to develop new cutting edge technologies.

I wish you all success!

Contact Information

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