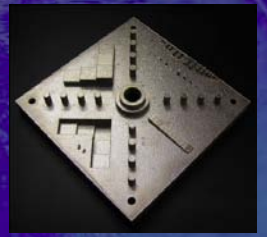


**Roadmapping Workshop:
Measurement Science for Metal-Based
Additive Manufacturing**

December 4-5, 2012 • National Institute of Standards and Technology • Gaithersburg, MD



**Report Out
December 5, 2012**

**Breakout Out Group:
AM Qualification & Certification**

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Desired AM Capabilities/Technologies

- Reliability
 - Process repeatability
 - 3rd party validation of equipment and materials
 - Equipment standardization
- Standards
 - Consistency of materials, processes and machines
 - Standardized validation tools and methods
 - Single source of standards
 - Standardized repairing, materials handling and software



Desired AM Capabilities/Technologies

- Qualification/Certification Process
 - Rapid qualification and certification with defined requirements
 - Feedstock supply
 - Computational assisted material qualification
 - Post process specification
- Process Specific
 - In-situ characterization and process analysis
 - Closed-loop control
- Data
 - Wider and more open access to data on materials and parts
- Other
 - Training and certification programs for AM workforce across all platforms



Top-Voted Challenges/Priority Topics

- Standard Guidelines for Qualification and Certification
 - For process, machine and part
 - Single source
- Process Control
 - In-situ measurements
 - Process feedback
 - Closed and open loop processes
- Predictive capabilities from material through process to part
- Standardized inspecting and reporting
- Shared repository of data



General Comments/Ah-Ha Moments

- The deer!
- Attendees were very much in concert/agreement about the challenges, and challenges were logical/reasonable
- Everything on the boards was inter-related
- Workshop helped us think through the big picture
- Its difficult to focus because the problems are so broad, opportunities are needed to create win-win situations (e.g., Round Robin testing – a learning experience for all, helps us identify what we don't know)