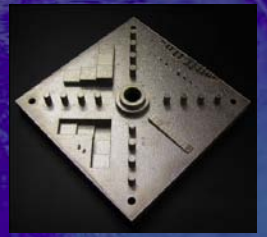


**Roadmapping Workshop:  
Measurement Science for Metal-Based  
Additive Manufacturing**

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



**Report Out  
December 5, 2012**

**Breakout Out Group:  
AM Materials**



## **Desired AM Capabilities/Technologies**

- Deep metallurgical knowledge on material properties of powder and wire (Knowledge Capability)
- Materials database and standards specification for AM materials (Knowledge Capability)
- Sustainable supply chain that provides reliable, consistent, and available materials for AM
- Advanced process control that enables management of material properties, residual stress, distortion, etc. during manufacturing process
- Materials specifically designed for AM and that take full advantage of AM benefits – “Buildability”
- AM able to produce materials by design that have properties specific to application



## Top-Voted Challenges/Priority Topics

- Lack of robust, real-time, in situ monitoring , analysis and feedback regarding material properties, distortions, etc. during manufacturing process (Measurement Barrier)
- Lack of understanding of post-processing issues regarding materials properties of AM produced products (Technology/Processing Barrier)
- Lack of material database for certification (Standards Barrier)
  - Microstructure, chemistry, etc.



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## Ah-Ha Moments

- Emphasis on residual stress
- Requirements for post-processing
  - Importance of integration