



# ADDITIVE MANUFACTURING COMMUNITY

Strategy Days Summit

Ralph Resnick, Founding Director America Makes, FSME

November 6-7, 2019 | Marriott Marquis Chicago



**America Makes**

*AMT News 10/2019*

# “Production-quality Additive Manufacturing faces growing Pains”

Tim Shinbara

AMT Vice President & Chief Technology Officer

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# Importance of standards

- Need to get all on the same page and bring calm to the chaos
- Many Standards Development Organizations (SDOs) working niches
- America Makes & ANSI teamed to form Additive Manufacturing Standards Coalition (AMSC)
  - Bring together over 30 SDOs and 240 individuals
  - Established AM Standards Roadmap (Version 2) – identified over 90 gaps
  - Recently announced portal tracking activities addressing gaps



# Quality Assurance of AM Materials

- Consistency and repeatability of feedstocks
- Proper storage and maintenance throughout supply chain
- Feedstock testing for particle size, shape, distribution, flowability, etc.
- Quality Assurance of AM

# Quality Assurance of AM Processes, Post Processes, Parts

- Complexity and flexibility leads to significant variability
- Fundamental understanding and control of metallurgy & microstructure and printing processes
- AM practitioners largely unfamiliar with manufacturing and production disciplines
  - Controlling variability – statistical process control
  - New requirements controlling internal material compositions and geometries unlike subtractive
  - Accurate and repeatable equipment meeting standardized testing protocols (ISO 230)
- Unique additive metrology needs – materials and parts (standards)
- Unique postprocessing demands – i.e., “adaptive heat treat?”

# Comprehensive Supply Chain/Ecosystem

- Distributed or vertically integrated?
  - How much needs be done where to maintain control?
- Digital Thread
  - Clearly defined workflows and tracking
  - Access to process data?
  - Data handoff to process steps
- Robust material supply
  - Decoupled like subtractive?