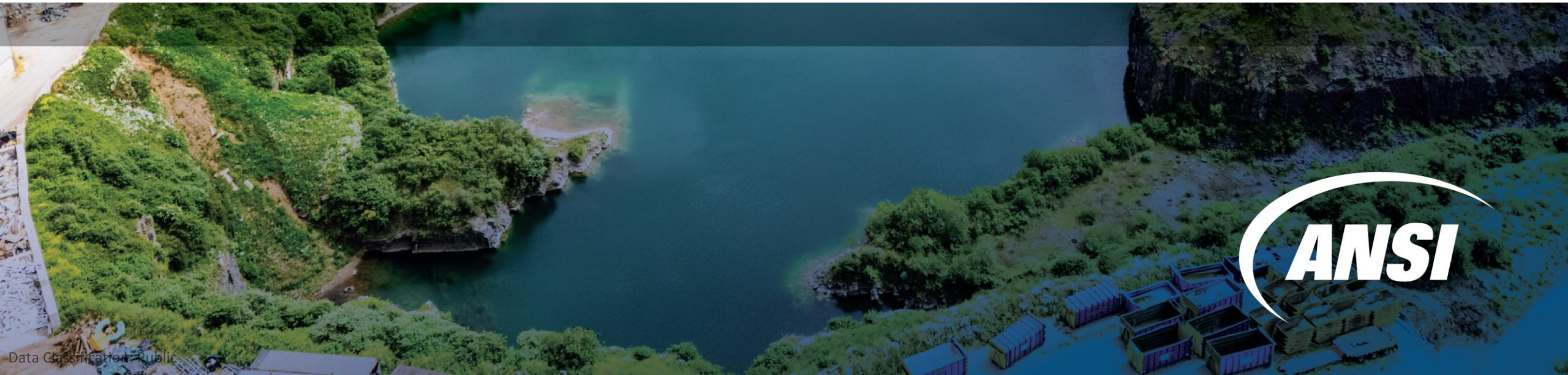




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Structural & Advanced Materials Deep Dive

Moderated by:
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S Scope | Structural & Advanced Materials

Technologies that use critical minerals in engineered materials designed to:

- *provide structural, mechanical, thermal, chemical, or functional performance*
- *including alloys, composites, superalloys, catalysts, and additive manufacturing feedstocks.*

*Discussion topics may include **material characterization, qualification and certification** requirements, **performance testing**, and standards supporting **advanced manufacturing applications**.*

1 Desired-End State | Structural & Advanced Materials

- *What outcomes are stakeholders seeking to achieve in downstream activities, including manufacturing, component production, and end use?*
- *How do downstream requirements depend on upstream inputs and midstream material specifications?*
- *What capabilities are currently in place, and what additional capabilities are needed to support consistent implementation?*
- *What does U.S. leadership in the global market look like, and what are the indicators of success?*
 - *Leadership in standards? Are we there yet?*
 - *Leadership in the market? Are we there yet?*
- *What role do standards play in the desired end-state?*

Advanced materials containing critical minerals can be locally sourced, readily accessible, and consistently characterized, qualified, manufactured, and deployed across industrial sectors.

Key Characteristics:

- **Performance-based specifications**
- **Standardized testing methods**
- **Reference materials**
- **Consistent qualification pathways**
- **Advanced manufacturing readiness**

- *How do regulatory frameworks, product requirements, trade conditions, and conformity assessment approaches (e.g., testing, inspection, certification) affect downstream applications?*
 - *Do these approaches leverage standards? Which?*
 - *How do these approaches affect (enable or hinder) standards implementation?*
 - *Where do differences across jurisdictions or systems create challenges for implementation or for accepting inputs from upstream and midstream stages?*
- *Where none exist, should they? Why type?*

Feedback Prior to Workshop:

1. Aerospace qualification requirements
2. Defense material requirements
3. Industry-specific certification programs

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here

3

Implementation Experience & Barriers | Structural & Advanced Materials

- *How are standards applied today? Is it effective implementation?*
- *What challenges have stakeholders encountered in integrating materials into manufacturing processes or final products?*
- *What factors (e.g., technical, operational, or commercial) affect the ability to consistently use materials that meet product and performance requirements?*

Feedback Prior to Workshop:

1. Variable processing routes
2. Emerging material chemistries
3. Inconsistent test reporting
4. Qualification cost

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here

- *What standards or frameworks currently support downstream activities, including product specifications and performance requirements?*
 - *Organization level feedback is a great start!*
- *Where are gaps, overlaps, or inconsistencies observed, particularly in aligning material inputs with product-level expectations?*

Standards Utilized:

1. ASTM materials standards
2. Additive manufacturing standards
3. See also, ANSI [Additive Manufacturing Standards Database](#)
4. Discussion captured here
5. Discussion captured here

Gaps :

1. Lack of semiconductor-grade specifications
2. Limited impurity standards
3. See also, ANSI [Additive Manufacturing Standards Roadmap](#)
4. Discussion captured here
5. Discussion captured here

- *Where is alignment needed between downstream requirements and upstream/midstream capabilities?*
- *What challenges arise in ensuring that material specifications, data, and performance criteria are compatible across the value chain?*

Feedback Prior to Workshop:

1. Connect material composition to performance
2. Harmonize qualification requirements
3. Align testing methodologies

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here

- *What data, definitions, or technical inputs are needed to support downstream applications and their connection to earlier stages of the supply chain?*
- *Are there areas where additional work is needed before standards can be developed or more widely implemented?*

Feedback Prior to Workshop:

1. Shared material databases
2. Processing-performance correlations
3. Reference materials
4. Standard reporting method

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here