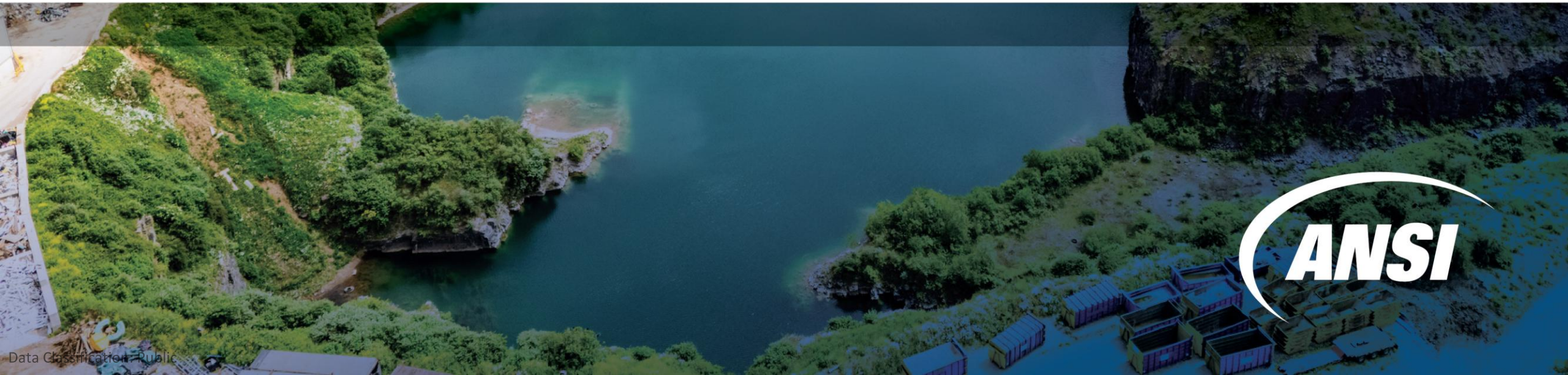




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Semiconductors & Electronic Components Deep Dive

Moderated by:

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Semiconductor Industry Association



Technologies that use critical minerals in semiconductor materials and electronic components, including:

- *integrated circuits*
- *sensors*
- *capacitors*
- *power electronics*
- *advanced electronic systems*

*Discussion topics may include **material purity** and **qualification requirements**, **manufacturing quality controls**, **performance standards**, and **testing methods**.*

1 Desired-End State

- *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?*

Semiconductor and electronics manufacturers can source qualified critical mineral inputs with consistent specifications, traceability, and reliable quality assurance.

Key Characteristics:

- Ultra-high purity standards
- Trusted qualification systems
- Supply-chain visibility
- Reliable material characterization
- Global market acceptance.

- *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. CHIPS-related supply-chain requirements
2. Material disclosure frameworks
3. Product-level declarations
4. Trusted supplier qualifications

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here

- *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. Qualification complexity
2. Ultra-trace impurity requirements
3. Limited reference materials
4. High cost of validation

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 analytical methods
2. ISO/IEC 17025
3. Discussion captured here
4. Discussion captured here

Gaps :

1. Lack of semiconductor-grade specifications
2. Limited impurity standards
3. Discussion captured here
4. 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 upstream purity requirements with product needs
2. Harmonize qualification requirements
3. Improve traceability through supply chain

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. PPB impurity datasets
2. Semiconductor-grade reference materials
3. Qualification benchmarks
4. Chain-of-custody datasets

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here