CALCE Webinar for Industry

April 09, 2026

CALCE/SMTA Counterfeit Symposium in its Twentieth Year

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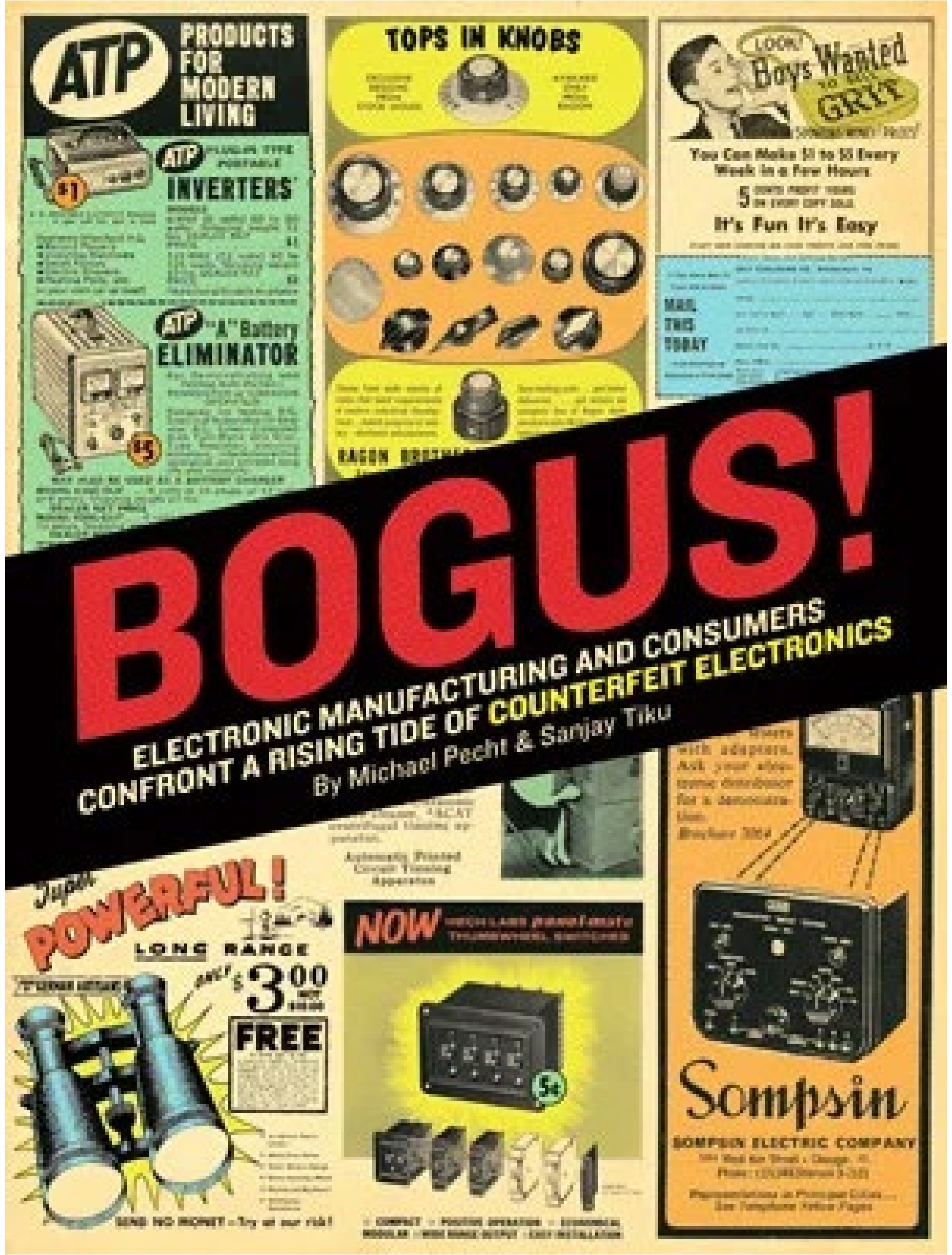


[Bogus: Electronic Manufacturing and Consumers Confront a Rising Tide of Counterfeit Electronics](), M. Pecht, S. Tiku, IEEE Spectrum Vol. 43, No. 5, pp. 37 – 46, May 2006.

One of the first articles by CALCE on the topic came out in 2006, and we started seeing instances of counterfeit parts at our laboratory, and also began realizing that we may have been overlooking this possibility as a source of problems.

Origin Story

- The symposium was founded in 2007 by the CALCE team, with Dr. Diganta Das serving as the Chair.
- The event was created to bridge the gap between anecdotal reports of fake parts and the need for rigorous, science-based detection and prevention methods.
- The Partnership: CALCE leads a team of technical committee members, and SMTA provides the industry network and organizing expertise.

The First Event

- You can see the event listing at https://web.calce.umd.edu/symposiums/adpcp2007.html
- The speakers came from government agencies, semiconductor companies, several technology companies, and testing laboratories
- Listing of all programs (along with other CALCE symposia) is at: https://calce.umd.edu/symposium-proceedings
- Access to the full presentations is limited to the event attendees and CALCE Consortium members

Core Objectives

- Awareness: Highlighting the legal, safety, and financial risks of counterfeit parts.
- Detection: Showcasing emerging technologies.
- Policy and Legal issues: criminal penalties for trafficking, and government-mandated procurement policies.

Common Highlights of the Event

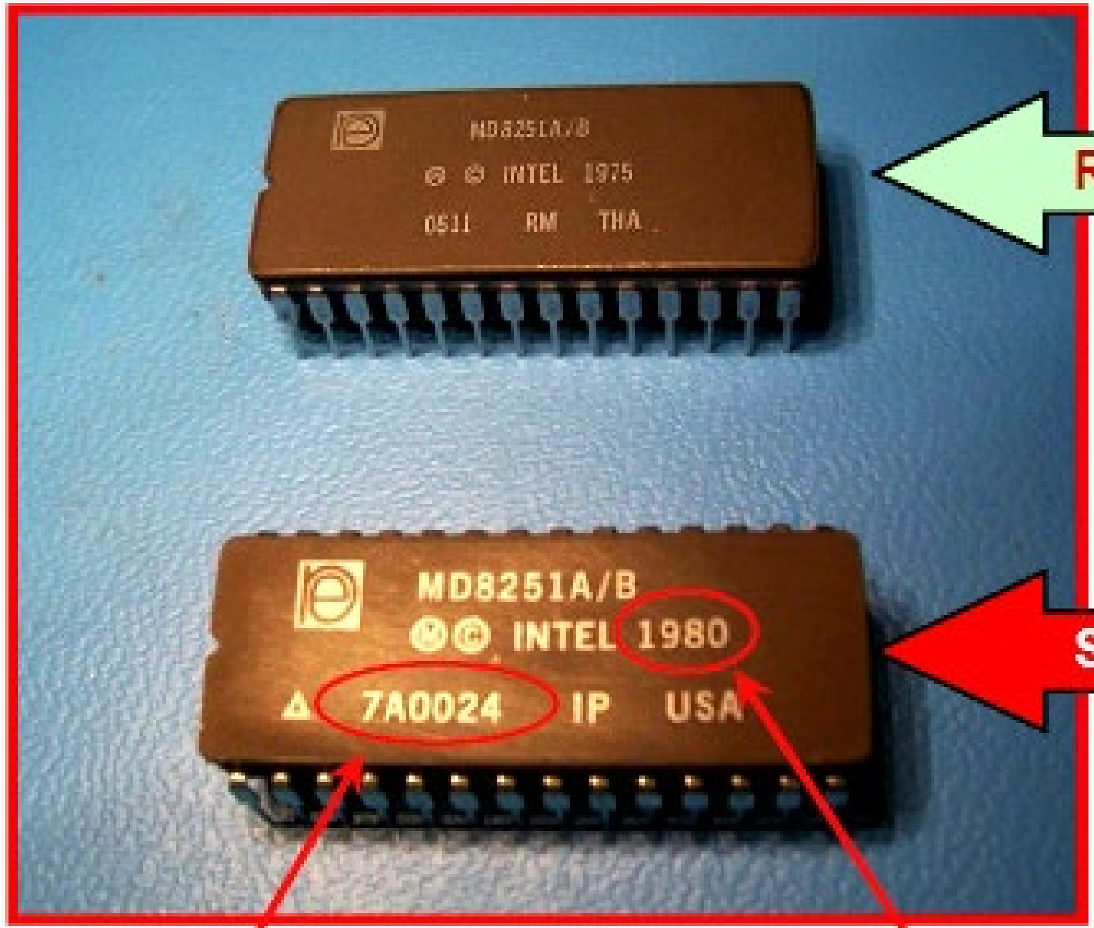
- A review of the counterfeit reporting data provided by ERAI
- Standards development updates
- Technology solutions for tracking and detection
- Exhibition of technology, services, and tools
- Panel discussions on topics of interest
- Professional development courses

Evolution of Topics

- 2007–2012: Focus on physical authentication and visual inspection.
- 2013–2019: Heavy emphasis on the development and implementation of SAE AS6171 and AS6081 standards.
- 2020–Present: Increased focus on Cybersecurity, Hardware Trojans, and the application of AI/Machine Learning for automated detection.

Examples of Counterfeits from the Early Days

The Differences Can also be Brazen



Rochester Device

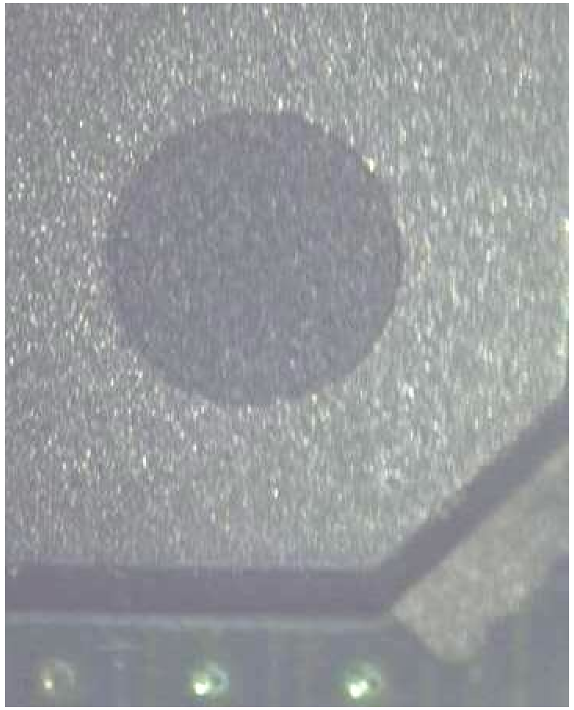
- Bought from an unauthorized distributor
- Identified by Rochester as an illegally manufactured part

Suspect Device

Date code not traceable to authentic product

Actual Intel copyright date is 1975

Counterfeit Motorola microcontroller



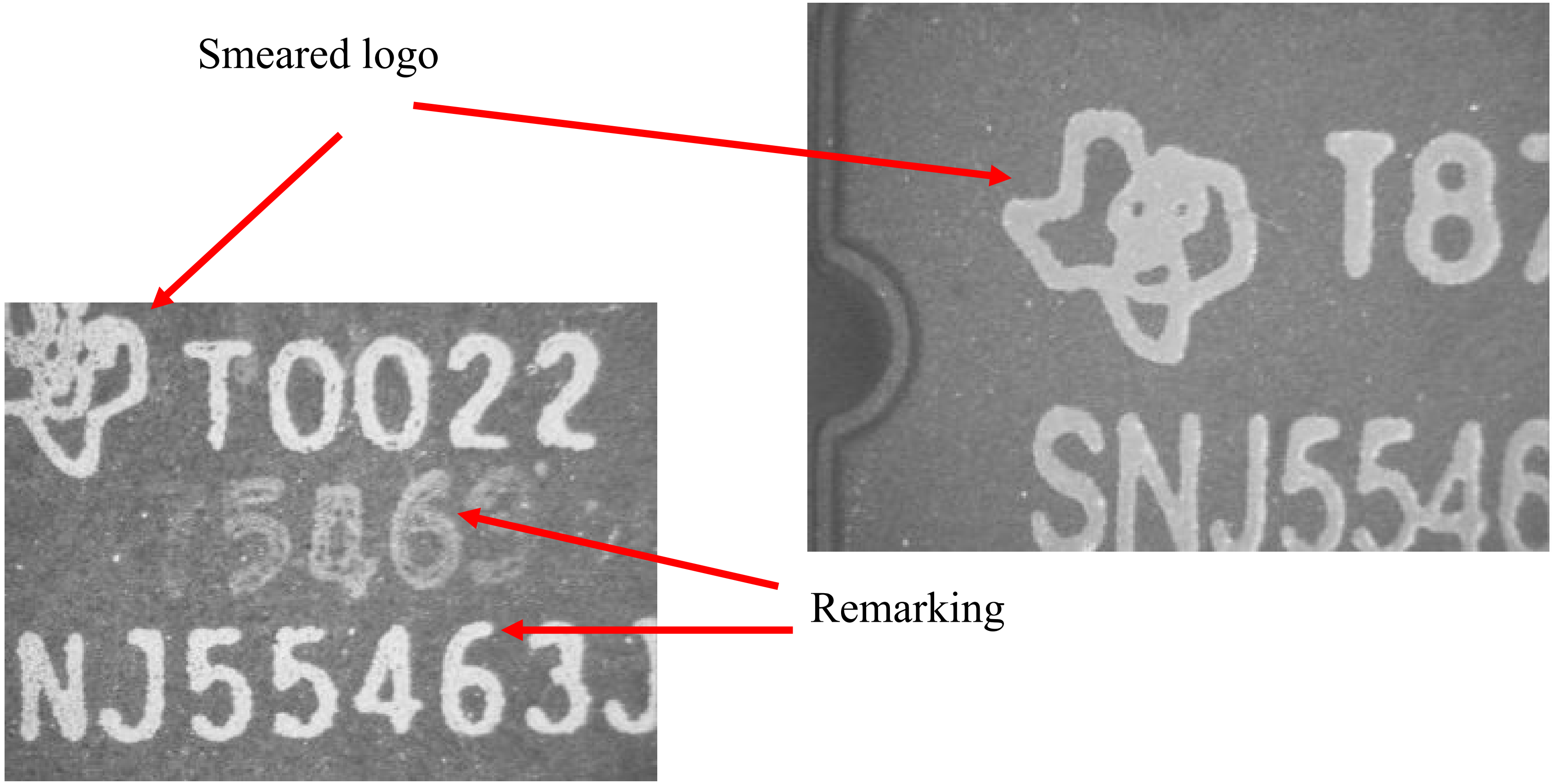
No country of origin marking

Authentic Motorola microcontroller

Authentic unit has country of origin marking

Part# marked in counterfeit part: MC68360CZP25L

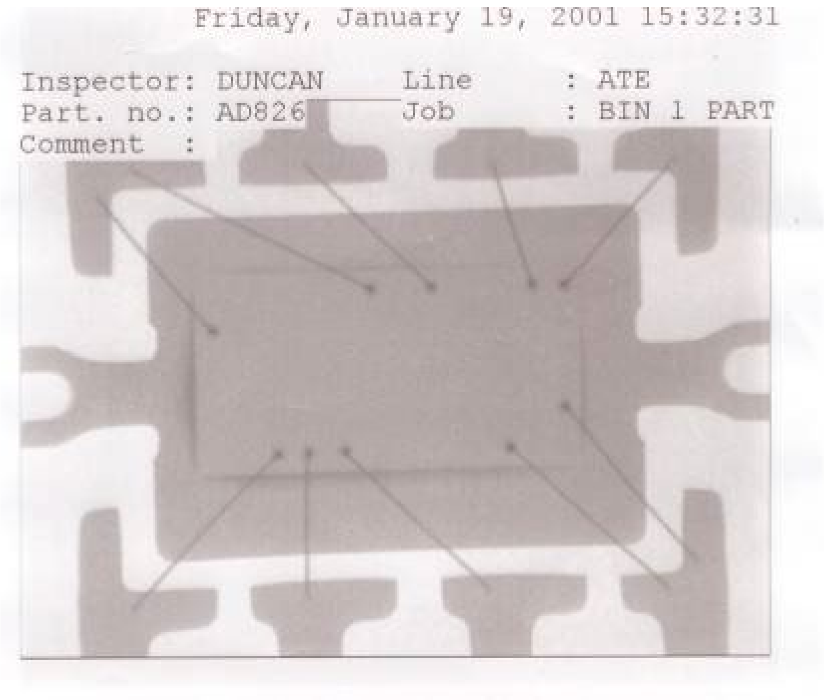
Part# marked in authentic part: 99MC68360ZP25L



Smeared logo

Remarking

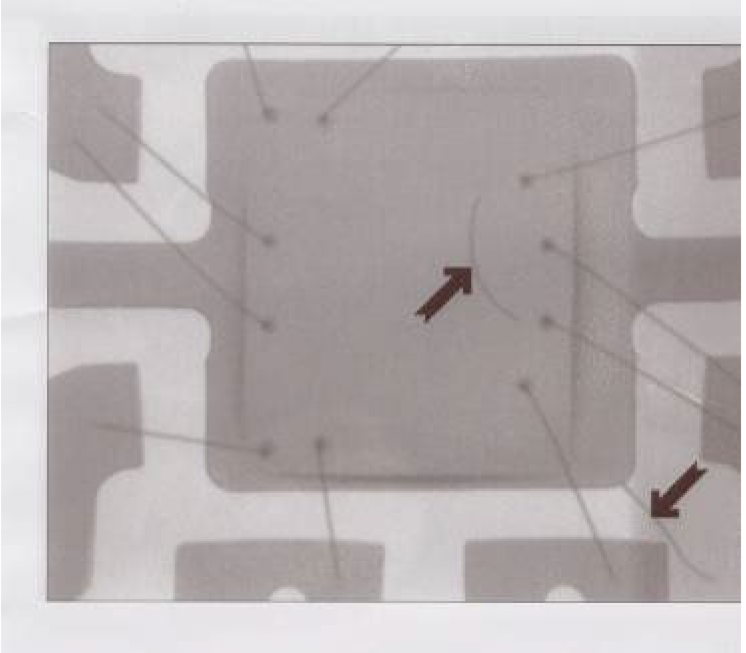
Izzo, J.M., “Counterfeit Risk Mitigation Process for Non-franchised Distributors”, CALCE Symposium on Avoiding, Detecting, and Preventing Counterfeit Electronic Parts, September 9, 2008.



Friday, January 19, 2001 15:32:31

Inspector: DUNCAN Line : ATE
Part. no.: AD826 Job : BIN 1 PART
Comment :

***Legitimate* AD826 X-ray**



***Counterfeit* "AD826"**

The Elantec counterfeit product appears to be assembly rejects!

Apple iPhone Charger – Low Hanging Fruit

Authentic **Counterfeit**

The authentic one says “Designed by Apple in California,” while the counterfeit has the puzzling text “Designed by California.”

The counterfeit also does not have the “Apple Japan” text below the plug.
They typically will not use the word “Apple” for legal or trademark reasons but might change it to “Abble” or other variations of that spelling…

Late 2010s: Standards and Technical Maturity

- AS6171 Implementation: Deep dives into the technical requirements for different test levels (Visual vs. Electrical vs. Material).
- Material Analysis: Increased use of analytical tools (e.g., Raman Spectroscopy and FTIR) for identifying non-authentic materials in packaging and leads.
- Counterfeit Batteries: Expansion of the topic list to include energy storage and lithium-ion battery safety.

2022–2023: Traceability and Post-Pandemic Supply Chain

- Track and Trace: Discussion of Blockchain and unique optical labels/marking to ensure provenance.
- Supply Chain Resilience: Moving from "Just-in-Time" to "Just-in-Case" procurement and the risks inherent in that shift.
- Independent Distributor Voice: Redefining how to audit and evaluate non-authorized distributors during periods of extreme scarcity.

2024–2025: AI, Geopolitics, and Cybersecurity

- Machine Learning & AI: Using computer vision for automated inspection and AI-based test augmentation to identify "aged" or used parts.
- Geopolitical Impact: How the CHIPS Act, tariffs, and export controls have reshaped the "gray market."
- Cybersecurity & Hardware Trojans: Moving beyond simple clones to focus on tampered software, hardware backdoors, and IP theft.
- Trusted Manufacturing: A focus on OAST (Outsourced Assembly and Test) and onshore manufacturing as a security measure.

Sessions to Remember

- First ERAI data crunch by Richard Smith
- Tom Sharpe of SMT Corp with his tour of recycling and refurbishment in China
- Sherri L. Schornstein (Assistant U.S. Attorney) with Andrew Olney (Analog Devices), Fred Schipp (MDA), Therese Randazzo (CPB-DHS), and William G. Ross (ICE-DHS), providing full details of the Vision Tech investigation
- Tracing Key Components Used in Russian Weapons Used – by Damien Spleeters of Conflict Armament Research
- …

Where Counterfeiting is Today

Top View of a Network Card
(known good card (left) and Suspect/Counterfeit card)

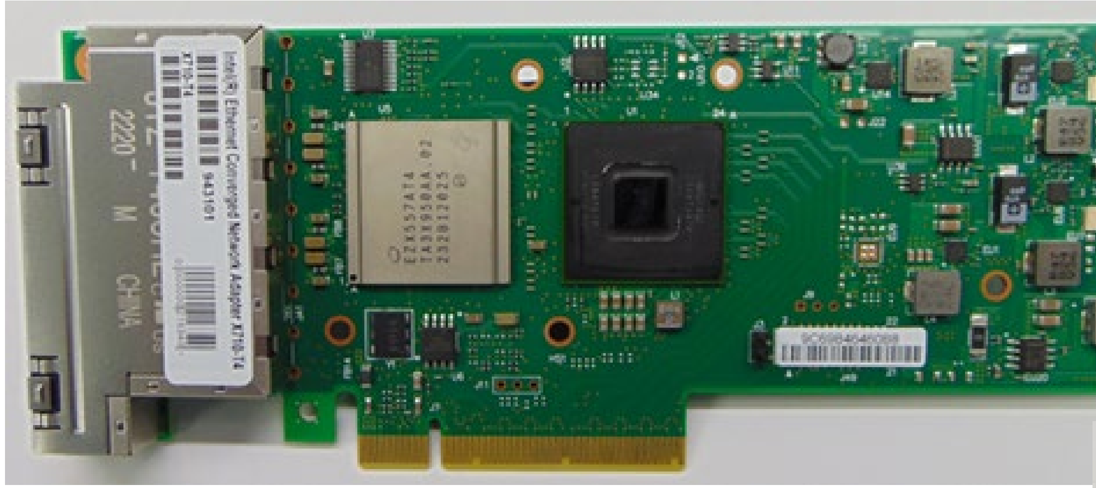


Illustration courtesy of Crystal Group Inc.

Bottom View of a Network Card
(known good card (left) and Suspect/Counterfeit card)

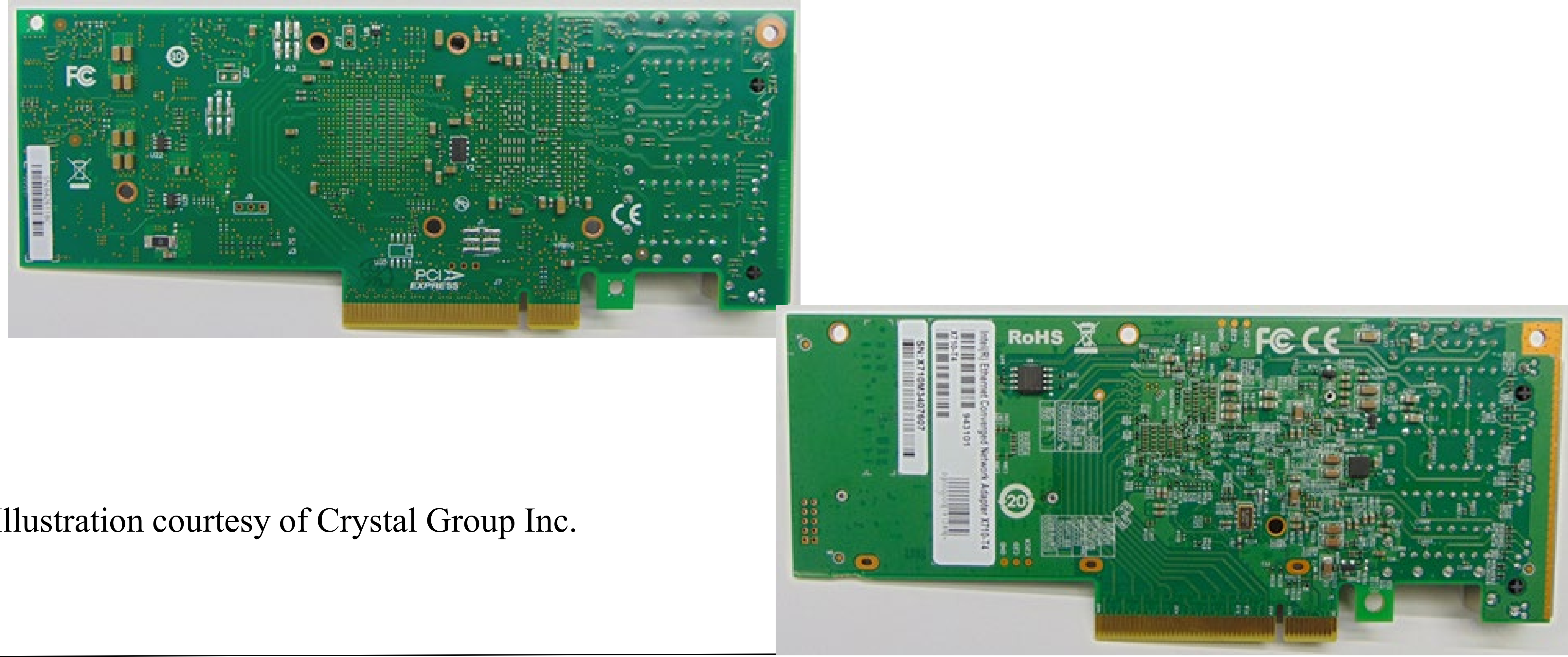
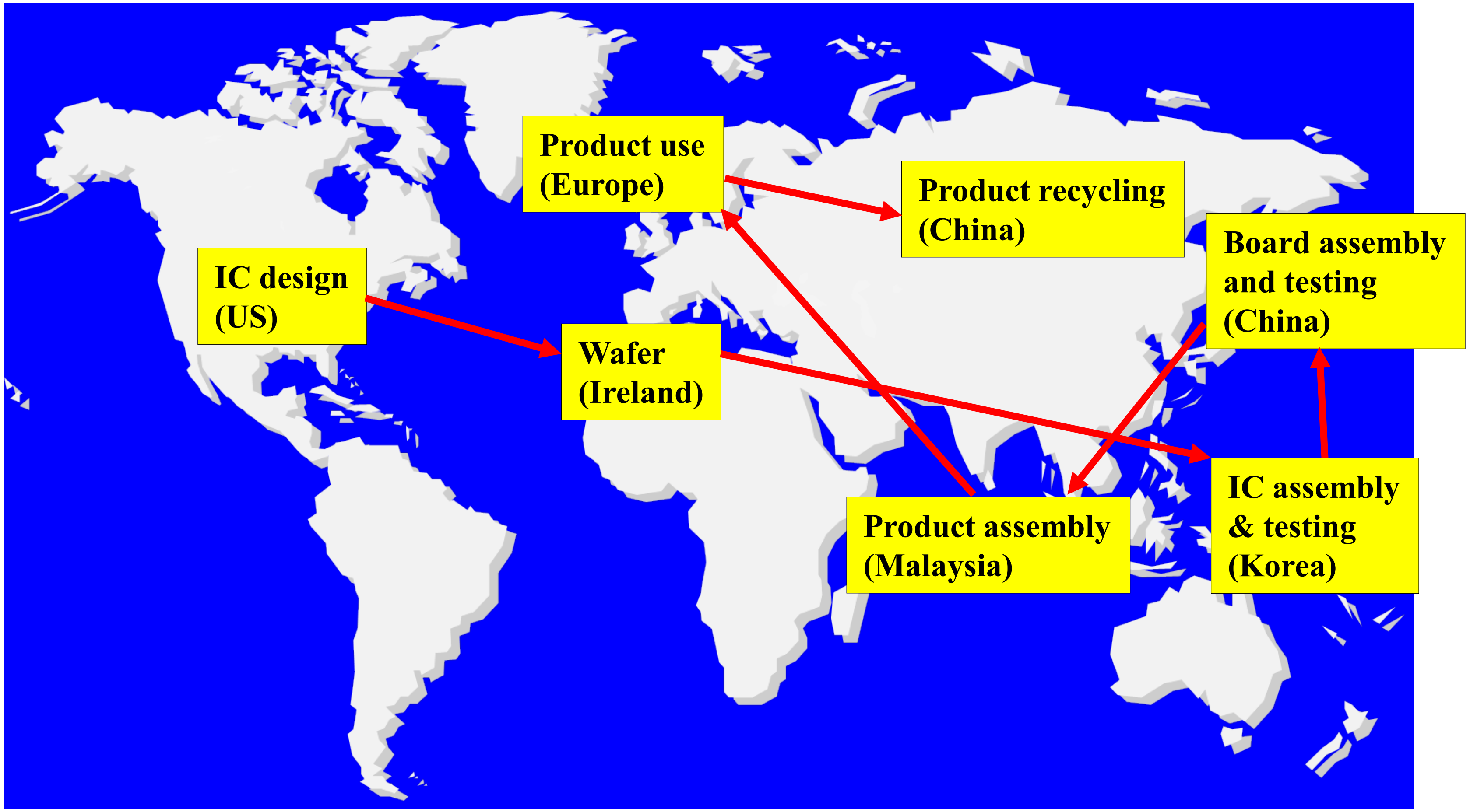


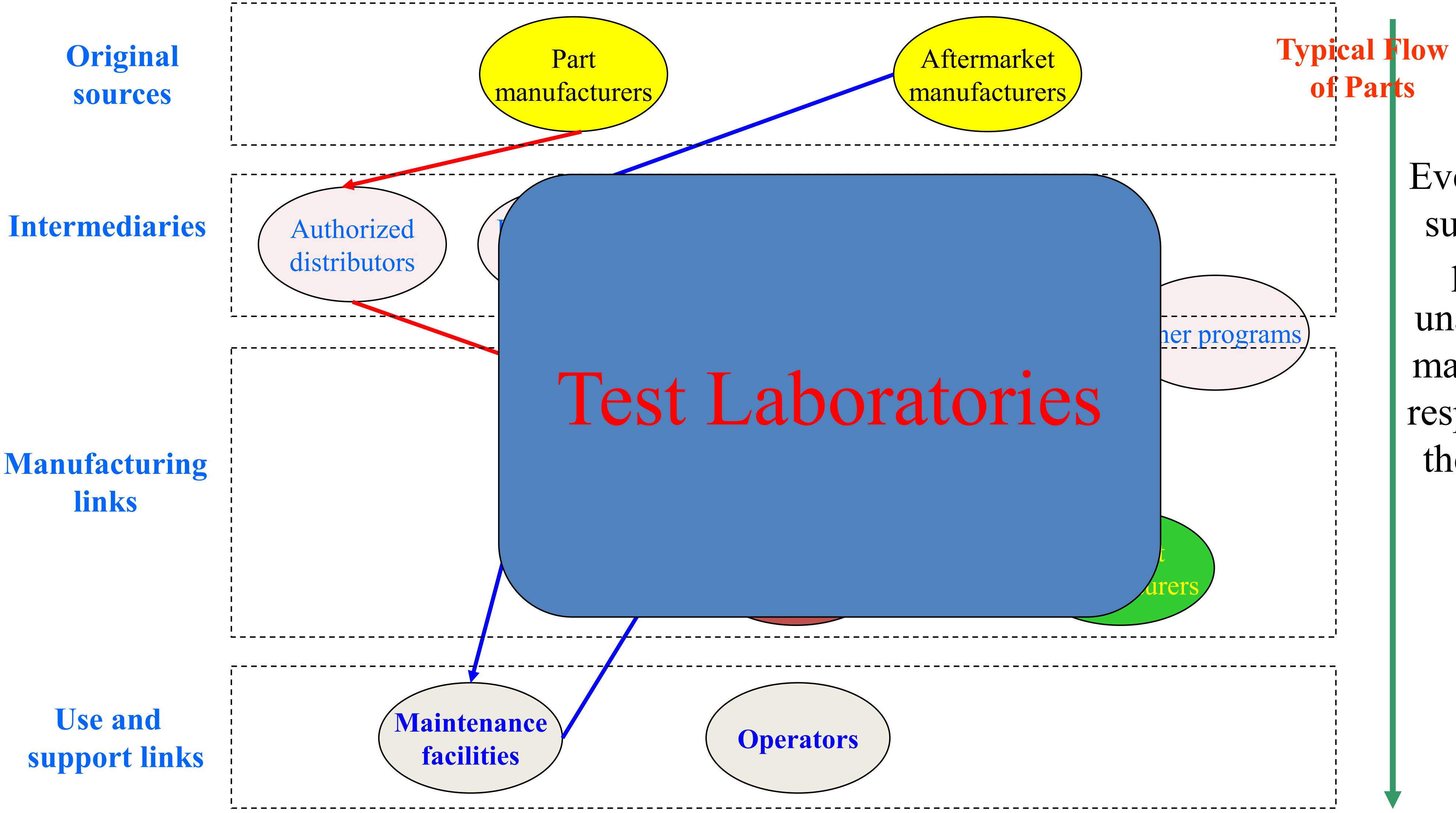
Illustration courtesy of Crystal Group Inc.

Global Nature of Electronic Part Supply Chain



Every participant in the supply chain can be a possible source of unauthorized parts and may pass them on. The responsibility to protect themselves is on each "customer" in the supply chain.

Example: Aerospace Electronic Parts Supply Chain



Original sources

Intermediaries

Manufacturing links

Use and support links

Part manufacturers

Aftermarket manufacturers

Authorized distributors

her programs

urers

Test Laboratories

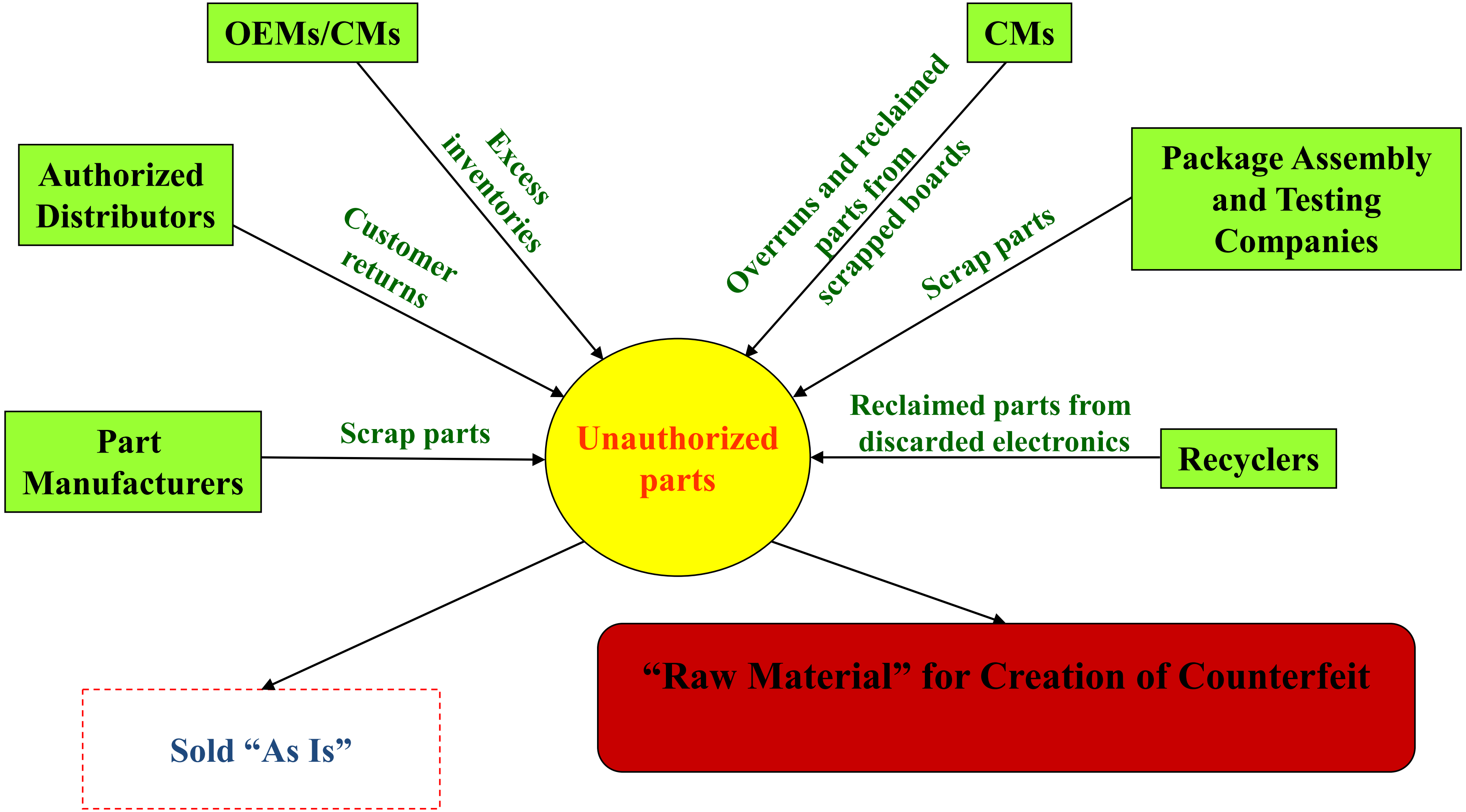
Maintenance facilities

Operators

Typical Flow of Parts

Every participant in the supply chain can be a possible source of unauthorized parts and may pass them on. The responsibility to protect themselves is on each “customer” in the supply chain.

Possible Sources of Parts Used to Create Counterfeits



OEMs/CMs

Excess inventories

CMs

Overruns and reclaimed parts from scrapped boards

Authorized Distributors

Customer returns

Package Assembly and Testing Companies

Scrap parts

Part Manufacturers

Scrap parts

Recyclers

Reclaimed parts from discarded electronics

Unauthorized parts

Sold "As Is"

"Raw Material" for Creation of Counterfeit

Selected Talks in 2026

- Evaluating Risk When Evidence Diverges: Astute Electronics
- Using Trusted Computing to Reduce Counterfeit Risk Across the Supply Chain: NVIDIA
- AI for Provenance and Traceability: Countering Counterfeit Risk in Semiconductor Supply Chains: Cadence
- Advanced Detection Techniques for Counterfeit Electronic Components: SMT Corp.
- Latest Developments of Anti-Counterfeit Aerospace Standards: SAE International
- AI Enhanced Physical Inspection for Counterfeit Microelectronics: NHanced Semiconductors

The full program will be available in the third week of April

Professional Development Courses in 2026

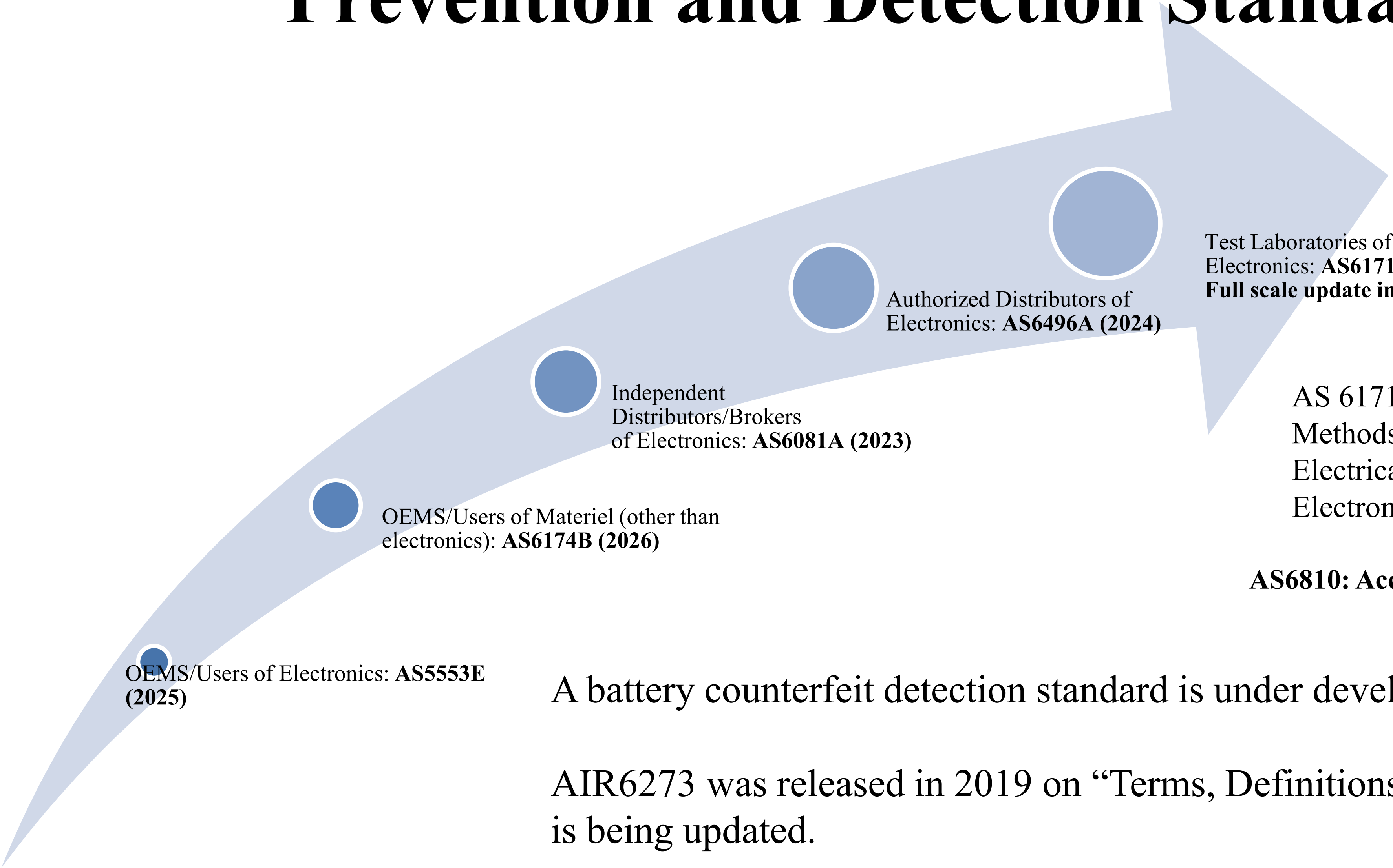
- Electronic Part Obsolescence Forecasting, Mitigation, and Management: Prof. Peter Sandborn
- Understanding and Implementing Industry Standards for Counterfeit Avoidance: Dr. Diganta Das
- How to Make the Best Use of 2026 Updates to SAE AS6171: Dr. Michael Azarian

These courses are included in the full symposium registration, but you can also register for a single day to attend only the courses.

Panel Discussions for 2026

- New release of the core counterfeit detection standard suite from the SAE 6171 with expanded coverage, including new detection tools and tampered defect coverage with leaders in the standards development and accredited laboratories
- Return to an era of allocation of components with long lead times, with high-level executives from the distribution industry

SAE G-19, G19A, G-21, and Other Counterfeit Prevention and Detection Standards



OEMS/Users of Electronics: **AS5553E (2025)**

OEMS/Users of Materiel (other than electronics): **AS6174B (2026)**

Independent Distributors/Brokers of Electronics: **AS6081A (2023)**

Authorized Distributors of Electronics: **AS6496A (2024)**

Test Laboratories of Electronics: **AS6171 (2018)**
Full scale update in progress

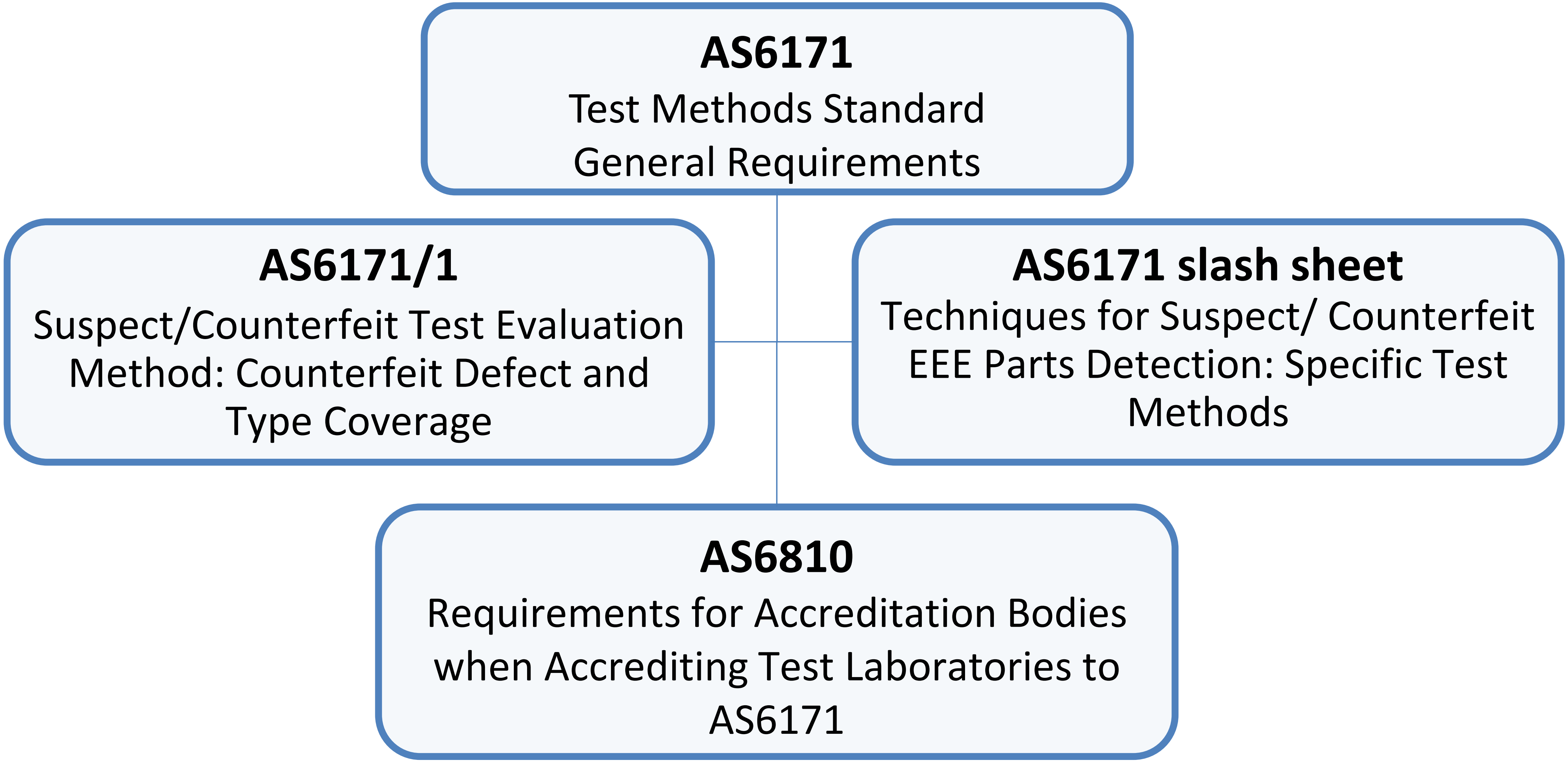
AS 6171/23 Techniques and Test Methods for Suspect/Counterfeit Electrical, Electronic, and Electromechanical Assembly

AS6810: Accreditation of Test Labs.

A battery counterfeit detection standard is under development in G21.

AIR6273 was released in 2019 on “Terms, Definitions, and Acronyms,” and it is being updated.

Organization of SAE AS6171



AS6171
Test Methods Standard
General Requirements

AS6171/1
Suspect/Counterfeit Test Evaluation Method: Counterfeit Defect and Type Coverage

AS6171 slash sheet
Techniques for Suspect/ Counterfeit EEE Parts Detection: Specific Test Methods

AS6810
Requirements for Accreditation Bodies when Accrediting Test Laboratories to AS6171

Test Methods in Published Slash Sheets

- **AS6171/2: External Visual Inspection** (EVI): incl. remarking, resurfacing, weight, dimensions, SEM – recently balloted
- **AS6171/3: X-Ray Fluorescence** (XRF): incl. lead finish, thickness – affirmation ballot on June 2022
- **AS6171/4: Delid/Decapsulation Physical Analysis** (DDPA) – ballot completed on March 4, 2025
- **AS6171/5: Radiological Inspection** (RI): X-ray imaging – affirmation ballot in June 2022
- **AS6171/6: Acoustic Microscopy** (AM): external and internal – passed ballot in Dec 2020. Release pending coordinated release of AS6171 updates
- **AS6171/7: Electrical Test**: Curve Trace, Full DC, Key Electrical Parameters for AC, Switching, and Functional Tests; incl. environmental, burn-in, seal test – affirmation ballot on June 2022
- **AS6171/8: Raman Spectroscopy**: materials identification – affirmation ballot on June 2022
- **AS6171/9: Fourier Transform Infrared Spectroscopy** (FTIR): materials identification – affirmation ballot in June 2022
- **AS6171/10: Thermogravimetric Analysis** (TGA): material analysis – affirmation ballot on June 2022
- **AS6171/11: Design Recovery** (DR): The second ballot of this document closed. No technical changes were needed to the document.

AS6171 Slash Sheets Revision

- **AS6171/2B: External Visual Inspection (EVI)** – Release pending coordinated release of AS6171 updates.
- **AS6171/4: Delid/Decapsulation Physical Analysis (DDPA)** –Release pending coordinated release of AS6171 updates.
- **AS6171/6: Acoustic Microscopy (AM)** – Release pending coordinated release of AS6171 updates.
- **AS6171/11: Design Recovery (DR) –** Release pending coordinated release of AS6171 updates.
- **AS6171/1: Test Evaluation Method –** In ongoing development for expected balloting. Counterfeit defect definitions and counterfeit defect coverages have been updated.

Status of New Slash Sheets

- **AS6171/13: Secondary Ion Mass Spectrometry -** Release pending coordinated release of AS6171 updates.
- **AS6171/17: (Confocal) Laser Scanning Microscopy (LSM/CLSM):** Release pending coordinated release of AS6171 updates.
- **AS6171/20: X-ray Photoelectron Spectroscopy:** Release pending coordinated release of AS6171 updates.
- **AS6171/22: Scanning Electron Microscopy (SEM):** Release pending coordinated release of AS6171 updates.
- **AS6171/23: Assemblies:** Release pending coordinated release of AS6171 updates.
- **AS6171/15: Part Packaging:** Comments from the ballot are in the process of being resolved with some significant restructuring of the document. The next ballot is anticipated in 2025 Q2.
- **AS6171/16: Netlist Assurance:** ballot closed on Feb. 17 with no disapprovals.

2026 Technical Committee

- Diganta Das, Ph.D., CALCE/University of Maryland, *Conference Chair*
- Sultan Ali Lilani, Lilani Consulting Group
- Steven R. Martell, Nordson T&I (retired)
- Scott McKee, 4 Star Electronics Inc.
- Anthony Mestre, Micross
- Anne Poncheri, InterCept
- John Radman, Element U.S. Space & Defense
- Bill Scofield, The Boeing Company
- Cameron Shearon, Raytheon Missiles & Defense
- Kevin Sink, TTI, Inc.
- Nicholas Williams, SMT Corporation

- **SMTA**: Kristin Nafstad, Senior Meetings & Events Manager with *Tanya Martin, Executive Director*

You Can Still Influence the Program

- While the abstract submission deadline has passed, you can contact me if you have a topic or an idea
- If you want a topic to be covered and do not see it in the program – let me know

How to Access Information

Main Event Page

Registration