

Defense Logistics Agency Land & Maritime Industry Association Roundtable

IPC – Association Connecting Electronics Industries

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IPC OVERVIEW

- **History**
- **IPC Today**
- **Mission & Vision**
- **Organizational Structure**
- **Membership**
- **Major Program Areas**
- **Global Initiatives**



Background and History

- Founded in 1957 as the **Institute of Printed Circuits** with six Member Companies
- Strong Foundation as Technical Organization Dedicated to Meeting Industry Needs
- Focus on Design, PCB Manufacturing and Electronics Assembly



IPC is an international industry association dedicated to furthering the competitive excellence and financial success of more than 3,700 member companies that make, use, specify and design printed boards and assemblies, including those in:

- advanced microelectronics
- aerospace and military
- automotive
- computer
- industrial equipment
- medical equipment and devices
- telecommunications industries

As the industry's leading source for standards, training, market research, solutions and public policy advocacy, IPC supports programs to meet the needs of an estimated \$2 trillion global electronics industry. IPC maintains offices in:

- Chicago, IL (headquarters)
- Atlanta, GA
- Washington, D.C.
- Brussels, Belgium
- Stockholm, Sweden
- Moscow, Russia
- Bangalore and New Delhi, India
- Qingdao, Shanghai, Shenzhen, Beijing, Chengdu and Suzhou, China



IPC Mission Statement

IPC is a **global industry association** dedicated to furthering the competitive excellence and financial **success of its members**, who are participants in the electronics industry.

In pursuit of these objectives, IPC will devote resources to management improvement and **technology enhancement programs**, the creation of relevant standards, protection of the environment, and pertinent **government relations**.

IPC encourages the active participation of all its members in these activities and commits to full cooperation with all related organizations.



Aspirational Goals

STANDARDS

IPC will be the most respected organization known for its leadership and global footprint in providing standards and quality programs supporting the electronics industry.

EDUCATION

IPC will become the world's leading electronics education and knowledge provider to the electronics industry.

ADVOCACY

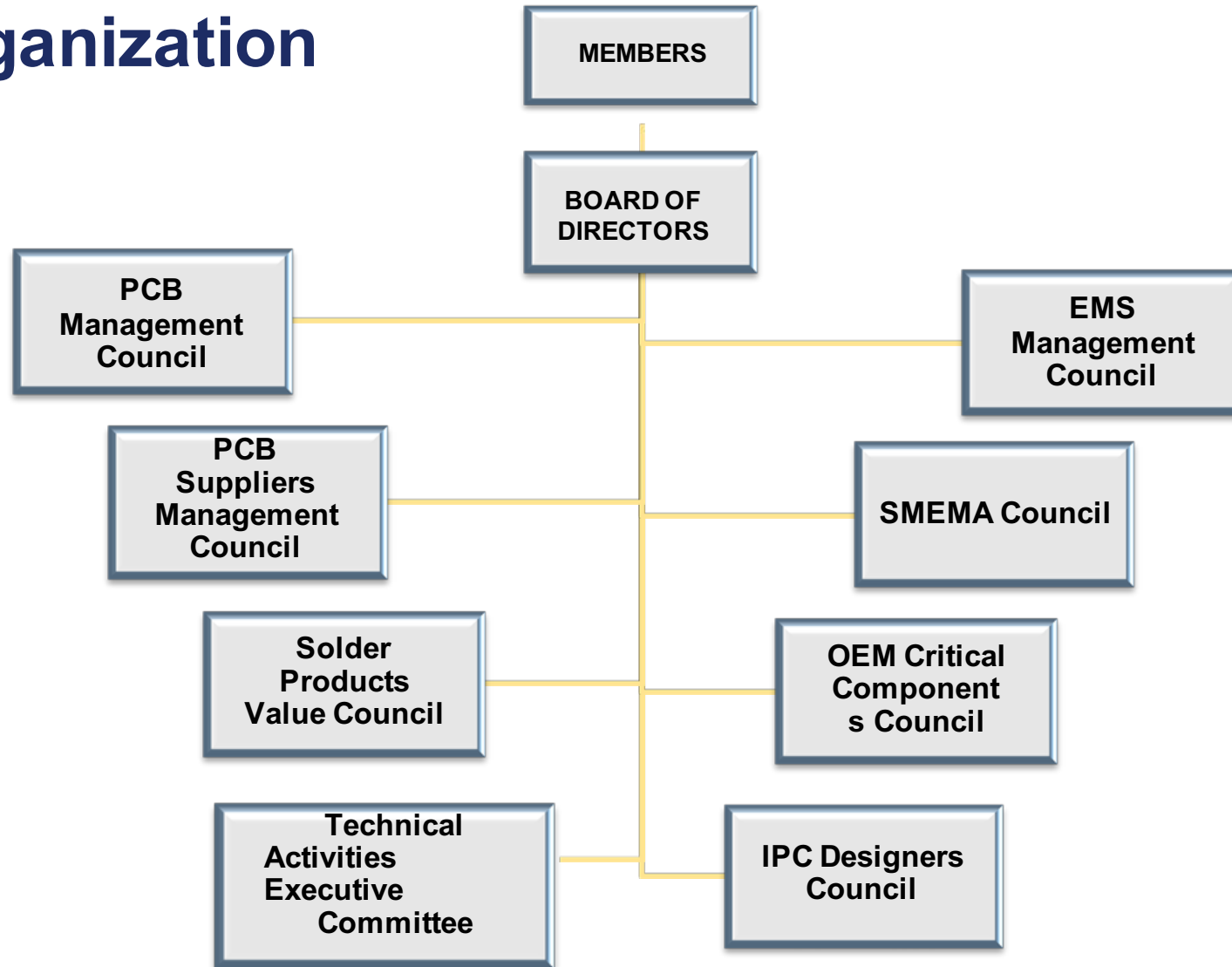
IPC will be known as the industry's most influential advocate for a regulatory and legislative business environment that enables our members to improve their global competitiveness.

SOLUTIONS

IPC will work with the electronics industry to identify and collaborate on finding solutions to industry challenges.



Volunteer Organization



Governance

- Each Council sets its own agenda, goals and member deliverables
- Board of Directors provides overall policy, vision and strategic direction for IPC
- IPC staff manages day-to-day activities of the association to implement the strategic policy

More than 3,700 Members Companies Worldwide

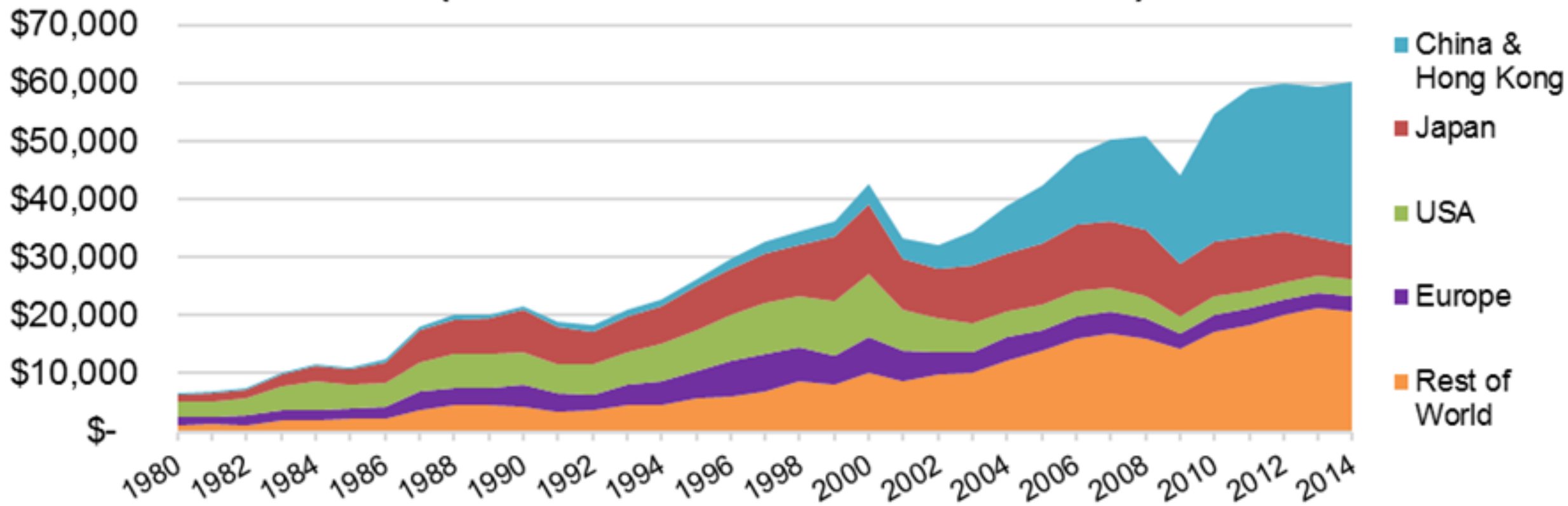
- Printed Circuit Board Manufacturers 9%
- EMS Companies 26%
- Suppliers of Equipment Materials, Processes and Services 24%
- OEMs 33%
- Government, Educational and Not-For-Profit Organizations 8%

Location

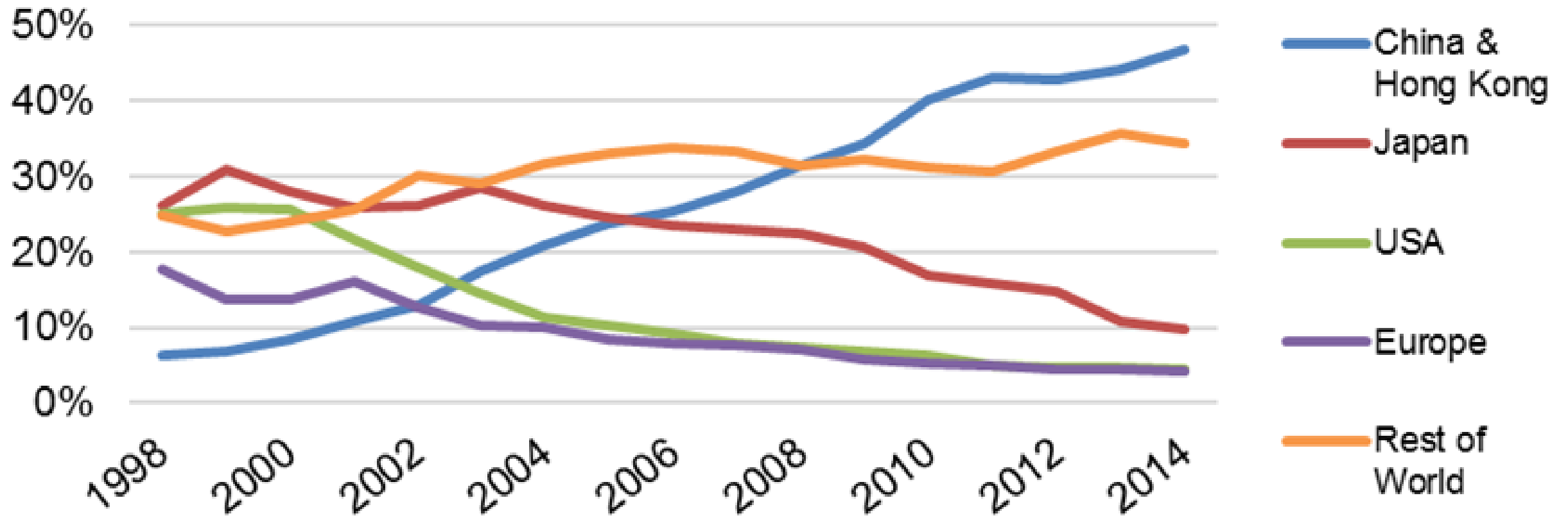
More than 3,700 Member Companies located in 64 countries

- North America 62%
- Asia 22%
- Europe 14%
- Rest of World 2%

Trends in Regional Growth of World PCB Production (in millions of nominal U.S. dollars)



Trends in Regional Shares of World PCB Production



What We Do

- Standards
- Training & Certification
- Management Programs
- Conferences & Exhibitions
- Professional Development – Technical Education
- Market Research
- Statistical Programs
- Public Policy Advocacy

IPC Standards

- Represent the best practices for electronics industry
- Highly focused on needs of the electronics industry
- Contain information related to the entire supply chain, from materials to final electronics assemblies



Standards Development

- Documents are developed by IPC committees
- Committee participation is voluntary for subject-matter experts from across the electronics supply chain

For more information regarding committee work, visit www.ipc.org/committees

Standards

- There are more than 300 standards in the IPC collection
- Standards are available in multiple languages and distributed globally
- Notification service is available on new releases

IPC Popular Standards by Market Segment

Electronic Components	Printed Circuit Boards		Electronic Assembly		Design
Components	Materials	Fabrications	Materials	General Assembly	Design
J-STD-020	IPC-4101	IPC-4101	J-STD-004	IPC-A-610	IPC 2220 series
J-STD-033	IPC-4200 series	IPC-4200 series	IPC-HDBK-005	J-STD-001	IPC-7351
J-STD-075	IPC-4412	IPC-4412	J-STD-006	IPC-7095	
	IPC4562	IPC4562		IPC-HDBK-830	
				IPC/WHMA-A-620	
				IPC-7711/7721	

Next Generation Standards

- Low Pressure Molding Design, Selection, and Application Guidelines
- Design and Assembly Process Implementation
 - of 3D Components
 - for Flip Chip and Die Size Components
 - for Embedded Components
- Requirements for Printed Electronics Functional Materials
- Intellectual Property Protection in Assembly Manufacturing
- Handbook on Adhesive Bonding in Electronic Assembly Operations
- Automatic Optical Inspection Characterization and Verification

Technical Certification Programs

- Industry-developed and approved
- Two-tier “train the trainer” approach for standardized classroom training to assure understanding of criteria in standards documents
- Training leads to a verifiable certification for the instructors, quality team, management and operators
- Knowledge-based certification programs for EMS program managers and for PCB designers also available

Councils

Identify members needs, develop programs and initiatives

- PCB Presidents Management Council
- PCB Suppliers Management Council
- EMS Management Council
- Surface Mount Equipment Manufacturer's Association
- Solder Products Value Council
- Designers Council
- Printed Electronics Management Council
- IPC Consultants Council

New Printed Electronics Council

- Standards
- Technical Programs
- Industry Advocacy
- Market Research

PERM

Pb-Free Electronics Risk Management Council

- Established to support companies manufacturing product with Pb-free electronics that require extended service life in harsh environments:
 - Military
 - Aerospace
 - Automotive
 - Medical
- Leadership and coordination of government and industry Pb-free electronics risk management activities
- Facilitate long-term strategies and tactics to deal with Pb-free issues
- Coordinate approaches to maintain safety, performance, reliability, and affordability



2017 Programs

February 12–16

IPC APEX EXPO 2017
San Diego, CA, USA

April 26–27

IPC Manufacturability Forum
Chicago, IL, USA

June 27–28

IPC Reliability Forum: Emerging Technologies
Dusseldorf, Germany

October 17–19

IPC Flexible Circuits — HDI Forum
Minneapolis, MN



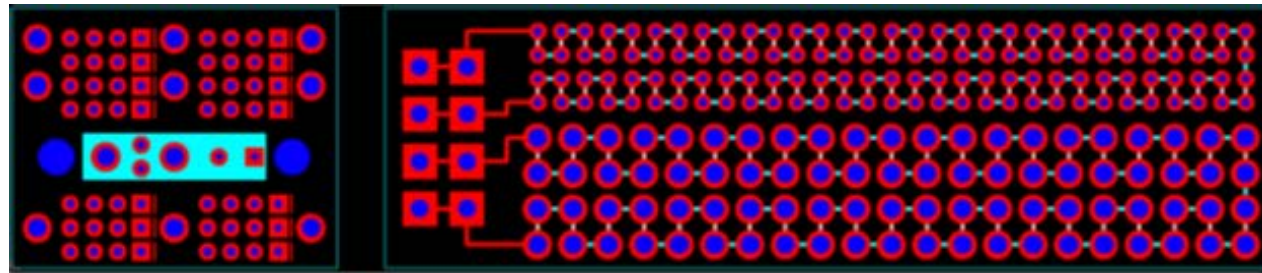
Major Studies

- World PCB Production Report
- Analysis & Forecast of the Global EMS Industry
- Analysis & Forecast of the North American PCB Industry
- Electronics Assembly Quality Benchmarking Study
- PCB Technology Trends
- EMS Wage Rate & Salary Study
- Market and issue-specific studies as needed (e.g., On-Shoring Studies) and Study of the North American Labor Pool

Industry Statistical Programs

- Participation is FREE to IPC members
Only participating companies receive the reports at no charge
- Monthly surveys for North American PCB and EMS companies track sales, orders, key markets and other metrics
- Quarterly survey for North American EMS companies tracks key financial and operational business performance metrics
- Quarterly programs for worldwide assembly equipment, process consumables, solder and laminate industries track sales trends and other metrics

VALIDATION SERVICES



Drivers for this Program

- IPC Members, Committee Chairs, Suppliers, and OEMs wanted a program to determine which printed board manufacturers met or exceeded the IPC standards and test methods
- List of Trusted Suppliers provided to the industry
- Industry wanted One Master Database to view all test data reports

Process Focused Audits

- 3 year Certifications
- Audits conducted by trained IPC personnel
- Annual Assessments (metrics are collected)
- Program Visibility – VS Website: www.ipc.org/validation

How Does the Program Work

- Master Database archives all test coupon results
 - Conformance based testing
 - Subscription will be available for OEMs to view the test data reports
- 3 reflow options/3 cycle ranges
- Test Coupon Submissions:
 - Class 3 will be Quarterly
 - Class 2 will be Semi-Annually
 - Required to maintain certification
- Once certified the PB Manufacturer will be listed on the IPC Validation Services QML web site



QML:

- J-STD-001/610 most popular
 - J-STD-001 Space Available
- 620 gaining acceptance
- 1071 and 1072 updated standards soon to be released
- 6012/600 new for 2016 gaining momentum

QPL:

- J-STD-004, 005, 006 are Available
- CC-830 committee currently is updating the standard and test methods
- 4101 is in planning stages



- Feedback from both OEM and current PCB fabricators is collaboration between IPC 6012 QML and MIL-PRF-31032 would be beneficial
- IPC exploring ways to tie in needs of 31032 in with 6012
 - Drafting 31032 addendum to 6012 as has been done for aerospace and automotive industries
- Seeking further collaboration

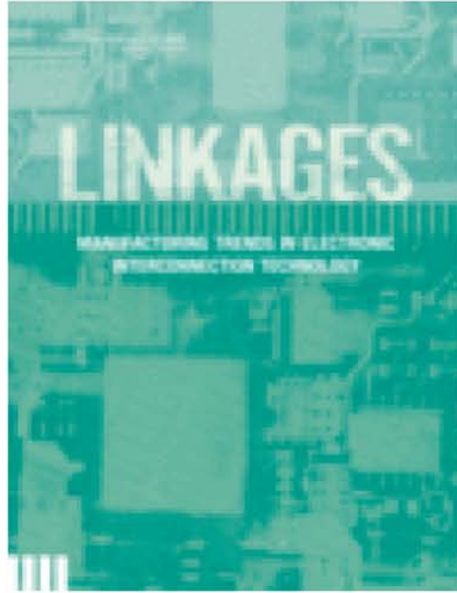
Best Industry Practices for Intellectual Property Protection in Printed Board Manufacturing

- Purpose The purpose of this standard is to assist printed board (PB) manufacturers in the development of requirements for the protection of intellectual property (IP) for their customers in commercial, industrial, and military and other high reliability markets. This standard will focus on protection of the inherent IP designed into the printed board such that IP flows from the customer to the PB manufacturer and IP that is incorporated into the PB is protected.
 - 1.3.3 Level 3 Advanced Level for Military, Government, and Commercial Intellectual Property Protection This level of requirements provides the highest intellectual property protection and is best suited for military and other high security systems. Items manufactured under Level 3 IP protection must be manufactured in the United States or in a State Department and DoD (or other appropriate government agency) approved location under the strict supervision of employees with U.S. or other required citizenship or residency status.

Standard for Manufacturing and Supply Chain Traceability of Electronic Products Based on Risk

- This standard defines a template which can be used for, but not limited to, the following products: Assembled PCBs, electronic products and assemblies, typically comprising SMT components (including discrete components), through-hole components and base materials (laminates, glass, resin, etc.)
- The document was developed based on a system-wide shutdown of operations due to a failed part from AT&T.
- Several OEMs have their own traceability requirements, so this document was developed so there is one industry standard that can be applied. The original focus was on SMT parts, but it is written in such a way as it can be applied to any aspect of the supply chain.

National Academy Study



Linkages: Manufacturing Trends in Electronics Interconnection Technology

Committee on Manufacturing Trends in Printed Circuit Technology, National Research Council

ISBN: 0-309-65427-0, 94 pages, 8 1/2 x 11, (2005)

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Recommendation 2: The Department of Defense should develop a method to assess the materials, processes, and components for manufacture of the printed circuit boards (PrCBs) that are essential for properly functioning, secure defense systems. Such an assessment would identify what is needed to neutralize potential defense system vulnerabilities, mitigate threats to the supply chain for high-quality, trustworthy PrCBs, and thus help maintain overall military superiority. The status of potentially vulnerable materials, components, and processes identified as critical to ensuring an adequate supply of appropriate PrCBs for defense systems should then be monitored.

Recommendation 4: The Department of Defense (DoD) should ensure access to new printed circuit board (PrCB) technology by expanding its role in fostering new PrCB design and manufacturing technology. DoD should sponsor aggressive, breakthrough-oriented research aimed at developing more flexible manufacturing processes for cost-effective, low-volume production of custom PrCBs. In conjunction with this effort, DoD should develop explicit mechanisms to integrate emerging commercial PrCB technologies into new defense systems, even if that means subsidizing the integration. These mechanisms should include more innovative design capabilities and improved accelerated testing methods to ensure PrCBs' lifetime quality, durability, and compliance with evolving environmental regulations for the conditions and configurations unique to DoD systems.

Thank you

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www.ipc.org

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