

Association Connecting Electronics Industries



Market Research from IPC

The Electronics Industry's Source of Original Data
and Insights for Smart Business Decisions



Studies and Reports Covering:

- *Printed Circuit Boards*
- *Electronics Manufacturing Services and Assembly*
- *Supply Chain*
- *Geographic Trends*
- *Compensation*

Market Intelligence and Business Data for the Electronics Industry and Interconnect Supply Chain

Your Trusted Source for Market Research

- **Reliable** — IPC has been serving the electronics manufacturing industry and conducting market research for more than 50 years.
- **Exclusive** — IPC's data sources are unique. No other provider of market research has access to data from so many companies in so many segments of the industry.
- **Global** — IPC has a worldwide reach, serving member companies in 65 countries around the world.
- **Extensive** — IPC's members include the leading companies in the global electronics supply chain, from materials to PCBs to EMS companies to end-product and equipment manufacturers, and IPC's market research covers all of these segments.

From the industry's most trusted source, IPC's market research studies and reports are designed to give industry executives competitive advantages:

- See market trends as they develop
- Track changes in your company's market share
- Identify growing and declining markets
- Compare your company's performance to industry averages

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Additional Market Research Benefits for IPC Members

Participation in IPC's Statistical Programs is an exclusive benefit of IPC membership. Participating companies enjoy access to free and timely data specific to their industry and product markets every month or quarter. Statistical programs cover the EMS, PCB, solder and assembly equipment segments.

Market Update at a Glance is a quarterly business summary report is published for IPC members only. It provides a quarterly update on sales growth by industry segment for PCB, EMS, semiconductors, solder and assembly equipment, as well as U.S. new orders for electronic end-products. Each issue discusses the latest economic trends and leading indicators, including IPC's Electronics Market Index. IPC members receive this report free as a benefit of membership.

IPC members receive substantial **discounts** on all market research reports purchased.

To join IPC or to learn about additional member benefits go to www.ipc.org/membership.

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Printed Circuit Board (PCB) Industry Reports

The quarterly **North American PCB Market Report** provides timely data on PCB market size, sales and order growth, order backlogs, returns, book-to-bill ratios, vertical markets and near-term forecasts. Data are reported for rigid PCBs and flexible circuits separately. The rigid PCB data are further segmented by company size tiers. Flex data includes trends in bare circuit versus assembly revenue sources. Trends in prototype sales are also reported. The reports are typically 60 to 70 pages.

Rigid PCB Order Backlog as a Percent of Shipments for the Current Month by Company Size

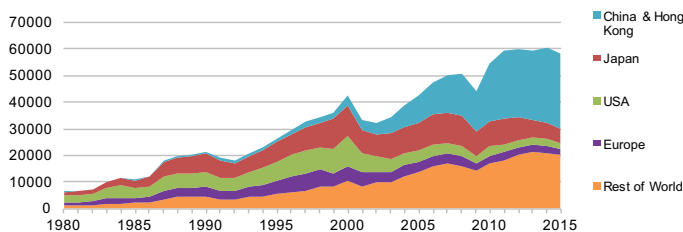


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IPC member \$495
Nonmember \$990

IPC's annual **World PCB Production Report** is the authoritative source of data on PCB production value by country and by product type. The estimates are developed through a consensus process by a team of the world's leading industry analysts. The report includes commentary on global and regional PCB industry trends, as well as historical PCB production data and regional production trends, and a special report on high-speed electronics.. 55 pages. Published in September 2017.

Trends in PCB Production Globally and for the USA (in millions of nominal U.S. dollars)

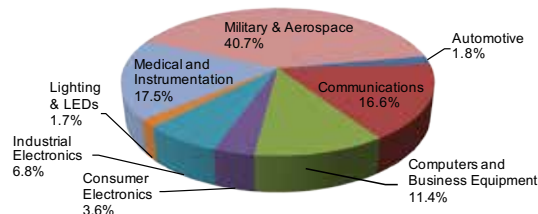


Annual Study

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The **2018 Annual Report on the North American PCB Industry** is a comprehensive overview of the industry with data and analysis on market size, sales growth, sales by product type, product mix (regular production vs. prototype), operational metrics, vertical end-markets, and U.S. imports and exports. 41 pages. Published in May 2018.

Vertical Markets Served by Reporting PCB Companies in North America in 2017



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Nonmember \$900

Annual Study

Trends in the North American Market for PCB Prototypes 2017

This report shows trends in PCB prototype sales and growth based on data from IPC's North American PCB Statistical Program covering 2014 through mid-2017. Data on prototype sales percentages by month compared to regular-production PCB sales, and estimates of North American prototype market sizes, are reported for all PCBs as well as for rigid PCBs and flexible circuits separately. The vertical market percentages for the industry's PCB sales overall are included for reference. 29 pages. Published October 2017.

IPC member \$250
Nonmember \$500

Fast Facts Study

PCB Technology Trends 2016 is a global study based on data from 118 electronics assembly companies and PCB fabricators worldwide. It presents data on the current state (2016) of PCB fabrication and assembly, and the industry's predictions for the data by 2021. The data are segmented by five applications: automotive, defense and aerospace, high-end systems, industrial and medical electronics. Topics include board properties (thickness, layer count, heat dissipation, tolerances), miniaturization (line width and spacing, I/O pitch, via diameters, aspect ratios, via structure, etc.), materials (rigid, flexible, stretchable, metal core, reinforcement, thermal properties, loss characteristics, lead-free, halogen-free, surface finishes, etc.), special structures (embedding, optical channels, chip packages, etc.), printed electronics usage (types, processes, applications and use of 3D printing), traceability, compliance and technical challenges, and general trends. 237 pages. Published in April 2017.

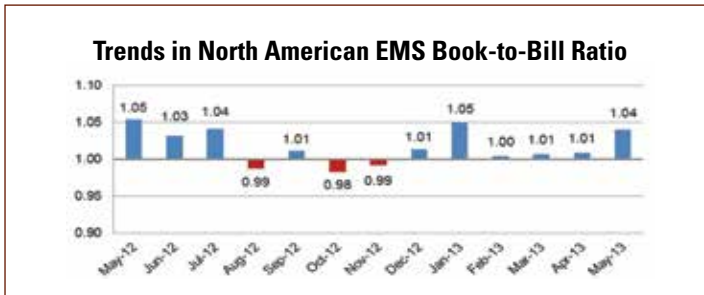
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Biennial Study



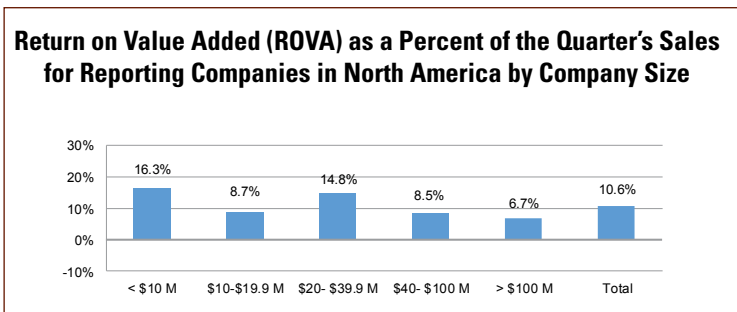
Electronics Manufacturing Services (EMS) and Assembly Reports

The quarterly **North American EMS Market Report** offers a timely update on EMS market size, sales and order growth, order backlogs, book-to-bill ratios and near-term forecasts, as well as vertical market percentages. Sales growth is reported for PCB assembly, box build, other types of production and other services, and is segmented by company size tier. Confidence indices show the industry's 90-day and 12-month sales outlook. The monthly reports are typically 27 pages.



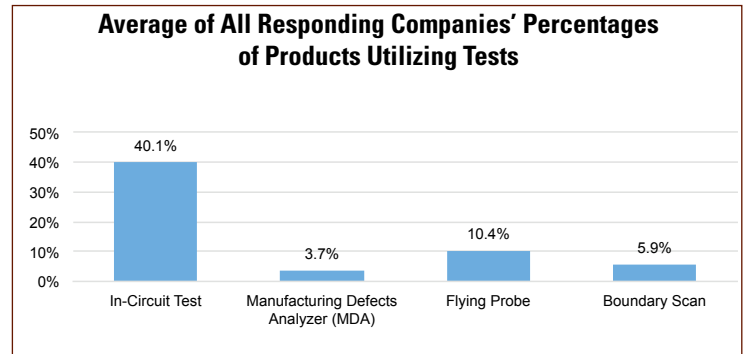
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The quarterly **North American EMS Business Performance Report** provides insight into EMS business metrics and growth. The report includes estimates of total market size and forecasts of current-year growth for the Americas and the world, as well as quarterly sales and bookings growth data and book-to-bill ratios. Average business performance data from the participating companies covers cost of goods sold; sales, general and administrative costs, and return on value added as percentages of quarterly sales; profit margins; cash-to-cash cycle time; days sales outstanding; standard credit terms; days of supply in inventory; and capacity utilization. Data are broken out by company-size tier. The quarterly reports are typically around 35 pages.



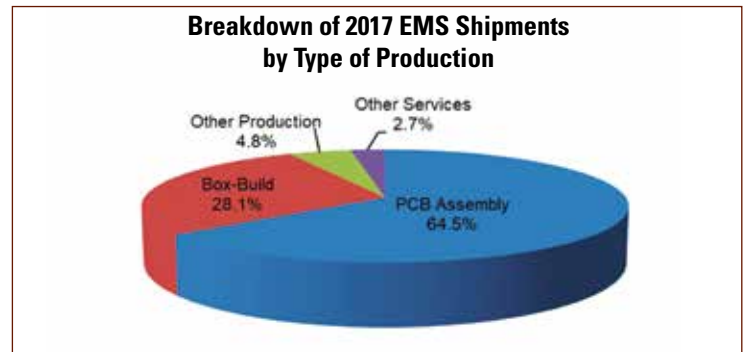
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The annual **IPC Study of Quality Benchmarks for Electronics Assembly** reports current industry averages, median values and 25th and 75th percentile data on production, assembly attributes, yields, defect rates (DPMO), customer returns, supplier performance, customer satisfaction and certification status. This report enables an electronics assembly company to compare its performance to aggregate results for companies in its size tier, region and product segment. 145 pages. Published in September 2017.



Annual Study
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The **2018 Annual Report and Forecast for the North American EMS Industry** is based on data collected from IPC's EMS statistical program and includes a five-year market forecast from New Venture Research. It covers market sizes, potential for market growth, sales and order growth, sales by product type and vertical markets, order backlogs, domestic production and number of EMS facilities in the region. Management data include revenue per employee, cost structure of North American EMS companies, average profit margins and EBITDA, return on value added, cash-to-cash cycle time, days sales outstanding, days of supply in inventory and capacity utilization. Data represent averages for all participating companies and most are segmented by company size tier. 35 pages. Published August 2018.



Annual Study
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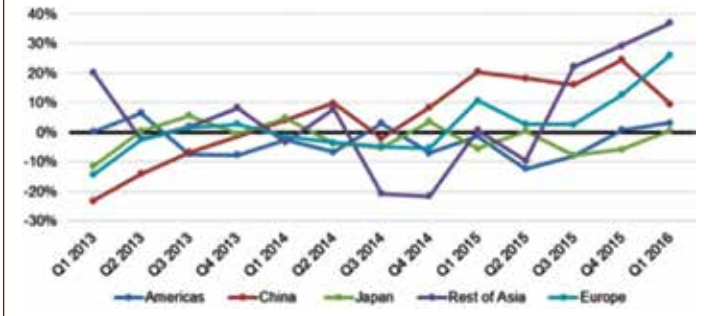
Supply Chain and General Industry Trends

The quarterly **Global Solder Market Report** is available by subscription. It covers trends in electronics-grade solder and flux consumption worldwide and by region, based on findings from IPC's Global Solder Statistical Program. Historical growth trends and current growth rates are segmented by product type, including solder paste, cored wire solder, solder alloy (bar and solid wire) and flux, and growth rates are based on unit consumption. The ratio of tin/lead to lead-free solder, including historical trends, is presented by region and by product type. The regions covered are China, Japan, the rest of Asia, Europe and the Americas, and current regional percentage shares are shown for each product type. The current percentage of SAC alloys in lead-free solder are reported, as well as the industry's three-month and 12-month growth outlook, historical metal price trends, and historical and forecast trends in metals and oil prices. The quarterly report is typically 36 pages. Also available in Mandarin Chinese.

The quarterly **PCB Assembly Equipment Market Report** is available by subscription. It covers trends in sales of PCB/electronics assembly equipment, based on findings from IPC's Global Assembly Equipment Statistical Program. Historical growth trends and current growth rates are shown for all equipment and also segmented by product type. Growth trends in the worldwide market are covered for screen printers, dispensers, ovens, automated optical inspection equipment, x-ray inspection equipment, other inspection equipment, test equipment and selective soldering equipment. Growth trends for the Americas market, presented separately, also include pick-and-place equipment. PCB assembly equipment growth trends are compared with those of semiconductor equipment, and the industry's three-month and 12-month growth outlook is included. The report is typically 47 pages.

Issues and Outlook for Lead-Free Electronics in Military & Aerospace Applications is a "fast facts" study focused on a single issue. Based on data from 83 manufacturers supplying electronics to the military and aerospace market, this study covers the current use of lead-free materials and components in mil/aero electronics. It examines how manufacturers required to use lead in their assemblies are coping with the trend toward lead-free electronics, including the use of reballing. It assesses the added costs of producing leaded assemblies and identifies the tipping points that are expected to move military electronics toward lead free. The report includes historical data on the ratio of lead-free to tin/lead solder consumption and a 10-year forecast. 19 pages. Published April 2015.

Regional Trends in Year-on-Year Consumption Growth for Solder



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Worldwide Automated Optical Inspection Equipment Shipment Growth Trend
Index to Baseline of 100 = Average for 2015

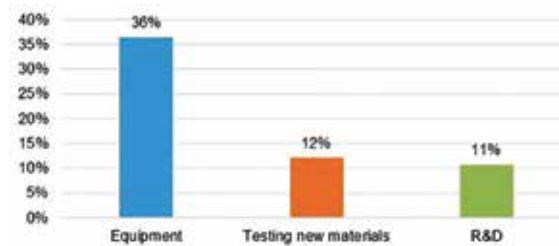


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Percentage of Responding Companies Planning to Invest in Expansion of Lead-Free Production in the Next Two Years



"Fast Facts" Study

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Geographic Trends Studies

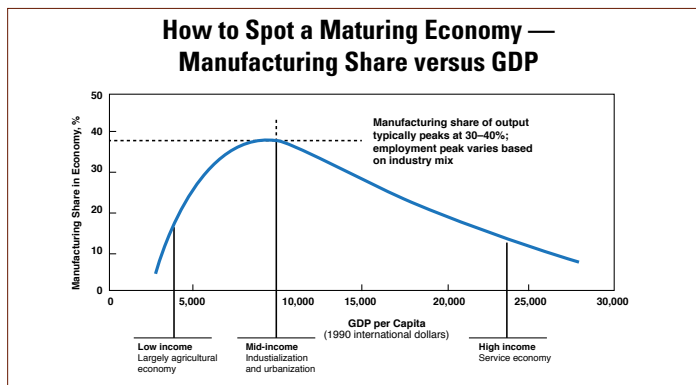
Findings on the Skill Gap in U.S. Electronics

Manufacturing reports on the results of a 2017 IPC survey of U.S. electronics assembly manufacturers on the impact of the skills gap. It identifies the hardest-to-fill production and engineering/professional positions, reasons applicants did not qualify, educational requirements for hard-to-fill positions, essential skills in short supply, the effect of H-1B visa availability, and companies' outlook for expanding their workforces and their businesses in the next year. April 2017. 31 pages.

| Study | IPC member | Nonmember |
|-------|------------|-----------|
| | \$250 | \$500 |

Where in the World? A Regional Strategy Roadmap for Electronics Manufacturers

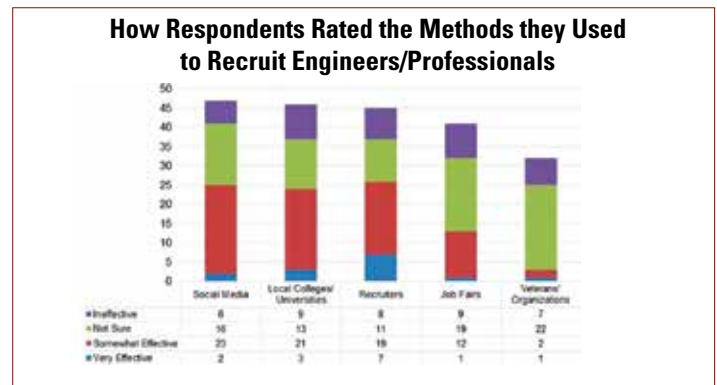
was developed by BPA Consulting Ltd. exclusively for IPC. It is a comprehensive guide for growth-minded companies around the world, particularly for executives planning global operations. The report discusses trends in the development of major regions for electronics manufacturing and offers a framework for comparison of both developed and developing economic regions. Thirty key countries are assessed as locations for possible investment in electronics manufacturing operations based on a comparison of relevant economic, social, legislative, educational, logistic and technical factors. It also describes how key industry sectors are benefiting from the local characteristics of each region. The report identifies the major assembly companies operating in each country, and the technological and market "hot spots" throughout the world. Also covered is the outlook for the development of industry capabilities and concentrations in key regions. 145 pages. Published in July 2014.



| Study | IPC member | Nonmember |
|-------|------------|-----------|
| | \$675 | \$900 |

IPC Study of the North American Labor Pool for Electronics Manufacturing

is based on data from 107 U.S. and Canadian electronics manufacturers and extensive secondary research. This report assesses the apparent shortage of qualified labor for electronics manufacturing. The data cover the causes of today's recruitment challenges, including public perceptions of the industry, dynamics of supply and demand growth, job candidate expectations, and supplier constraints. The current gaps in the labor pool are assessed by region and industry segment, as well as the issues impeding the recruitment of production workers and professionals, the industry's training needs and its image. An assessment of strengths, weaknesses, opportunities and threats in the current environment provides insight into strategies to address the current recruitment and training challenges. Recommendations and resources that can help manufacturers overcome the obstacles, such as sources of training grants and an assessment of recruitment channels, are included in the report. 52 pages. Published February 2015.



| Study | IPC member | Nonmember |
|-------|------------|-----------|
| | \$450 | \$900 |

On-Shoring in the North American Electronics Industry: 2014 Update of Trends and the Impact on Companies

includes the results of past IPC studies of planned and actual on-shoring and domestic sourcing activity, as well as new data from companies with actual onshoring experience about the impact on their operations and performance. The data identifies the industry segments engaging in on-shoring as well as the types of operations involved, origin and destination of relocated operations and numbers of jobs created by the responding companies. The 2014 survey data covers the impact of on-shoring on costs, delivery time, time to market, quality controls, inventories and sales. On-shoring drivers, deterrents and issues are discussed, as well as updates on recent on-shoring activity by major electronics companies. 54 pages. Published in June 2014.

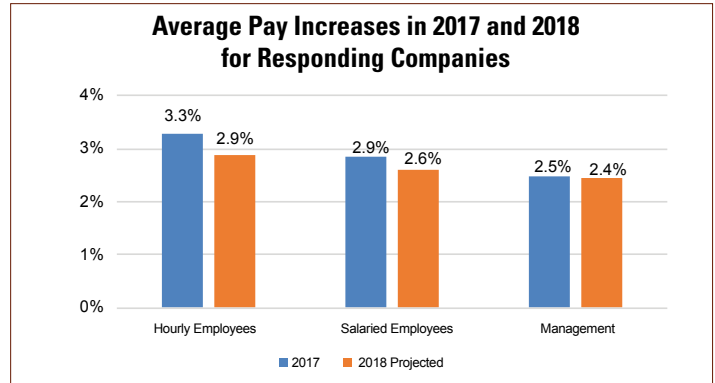
| Study | IPC member | Nonmember |
|-------|------------|-----------|
| | \$225 | \$450 |

Compensation Studies

IPC is the exclusive source for wage and salary studies specific to the electronics assembly industry in North America.

The biennial **2017 Wage Rate & Salary Study for the North American Electronics Assembly Industry** contains aggregate data on 40 positions and related job descriptions for North American EMS companies and OEMs, including salaried, hourly and sales positions. Industry averages, median values and 25th and 75th percentile data are reported by industry segment, regions and company-size tiers. The report also includes data on changes in salary budgets and pay raises for 2017 and 2018, spending on benefits and training, HR policies, benefits and sales compensation structure. The 49 companies in the survey sample reported on 63 facilities in the USA and Canada. 57 pages. Published in January 2018.

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| Biennial Study | \$450 | \$900 |



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HOW IS YOUR COMPANY PERFORMING COMPARED TO YOUR INDUSTRY?

WHAT IS YOUR INDUSTRY'S SALES FORECAST FOR THE NEXT THREE TO 12 MONTHS?

WHICH MARKET SEGMENTS ARE GROWING FASTEST? WHICH ARE DECLINING?

THE ANSWERS TO THESE AND MANY OTHER VITAL QUESTIONS ARE AVAILABLE TO YOU FREE AS A BENEFIT OF IPC MEMBERSHIP.

Eligibility to participate is an exclusive benefit of IPC membership. Statistical Programs are available to these industry segments:

- EMS companies in North American
- PCB fabricators in North American
- Assembly equipment manufacturers worldwide
- Solder manufacturers worldwide

The quarterly subscription reports described in this document contain findings from IPC's Statistical Programs. Participants receive the quarterly reports for programs in which they participate at no charge. They use the findings to support planning and decision-making. The data help them:

- estimate market share
- track market growth
- identify growing and declining demand for specific product types
- benchmark company performance against industry averages in specific segments

The surveys are secure and confidential. IPC protects the confidentiality of companies' data and publishes only aggregate results. Interested members should contact IPC's market research staff at +1 847-597-2868 or marketresearch@ipc.org.



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