IPC Study of Quality Benchmarks for Electronics Assembly 2019

EMS

INSTRUCTIONS

1. If you need a copy of the survey questions, a copy of the blank questionnaire in PDF is available here.

2. Please enter actual numbers (not in thousands or millions) and do not enter any non-numeric characters. Enter the full amount. You may use commas in numbers greater than 999, but they are not necessary.

3. In answering questions that require answers in U.S. dollars, if you need to convert other currency amounts to U.S. dollars, average 2018 exchange rates are available here.

4. Data reported in this survey should be based on 2018 activity and results.

5. If you need to leave an incomplete survey and return to complete it later, you may do so. Be sure to complete the current page and click the forward icon (>>>) to send that data. When you wish to resume the survey, use the same computer and browser, then click your original survey link to return to your survey.

6. When you have submitted your completed survey, you will not be able to re-enter the survey form to make changes. If you need to make changes to a submitted survey, please contact Piyamart Holmgren at piyamartholmgren@ipc.org or +1-847-597-2868.

PARTICIPANT INFORMATION
Please enter your IPC Company Code and Email Address. It is important that you enter this information correctly in order to ensure that your response will be processed. If you don't know your company code, contact Piyamart Holmgren at piyamartholmgren@ipc.org or +1-847-597-2868.

IPC Company Code
Email Address

Section I: Company Data

1. Please indicate your primary industry segment.

Original Equipment Manufacturer (OEM)
Contract Electronics Manufacturing Services (EMS Company)
Other (Please specify)

2. Estimated sales revenue for the year 2018.

Less than $10 million
$10 million to $24 million
$25 million to $49 million
$50 million to $99 million
$100 million to $499 million
$500 million to $1 billion
More than $1 billion

3. Please indicate the primary region in which your facility or facilities are located. (This pertains only to the facility or facilities that generated the data you are reporting.)

Asia
Europe
North America
Other Americas
Middle East & Africa
Section II : Production Data

4. The **product type** being produced. Check all that pertain to your data being reported in this survey.

- Rigid Printed Board Assembly
- Flexible Circuit and Rigid Flex Assembly
- Rigid Back Plane
- Molded Board
- MCM-C-L-D
- Discrete Wiring Terminal & Connectors
- Cable & Harness (Multiple Wires)
- Mechanical Assembly Operations
- Finished End-Product or System

5. What **IPC usage classes** do your products represent? Please estimate the percentages of the products you are reporting on in this survey.

   - **Class 1 – General Electronic Products**
     Products suitable for applications in which the major requirement is function of the completed assembly.

   - **Class 2 – Dedicated Service Electronic Products**
     Products in which continued performance and extended life are required, and for which uninterrupted service is desired but not critical. Typically the end-use environment would not cause failures.

   - **Class 3 – High Performance/Harsh Environment Electronic Products**
     Products in which continued high performance or performance-on-demand is critical, equipment downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the equipment must function when required, such as life support or other critical systems.

   - Total (should equal 100%)  

6. What are the **applications** in which your products are intended to be used? Please estimate the percentages of the products you are reporting on in this survey. (Category)
Section III: Assembly Attributes

7. Please estimate the percentage of components placed in 2018 that were the following types:

- SMT (surface-mount technology)  
- PTH (plated through-hole)

8. What is your inventory accuracy as a percentage of components on hand? (Inventory accuracy can be calculated by using the inventory adjusted numbers. For example, if you made an inventory adjustment of quantity = 100 and you had on-hand quantity = 1,000 parts for that component, your inventory accuracy would be 90% for that component.)

- SMT Components  
- PTH Components
9. What percentage of your products utilize the *in-circuit test (ICT)* method?

10. What percentage of your products utilize the *manufacturing defects analyzer (MDA)* test method?

11. What percentage of your products utilize the *flying probe* test method?

12. What percentage of your products utilize the *boundary scan* test method?

13. What percentage of your products utilize *automated optical inspection (AOI)*?

14. What percentage of your products utilize *automated x-ray inspection (AXI)*?

15. What percentage of your products have *final functional test*?

16. What was the average *first-pass yield* (in percent) at *final functional test or at final inspection* in 2018?
(First-pass yield is the percentage of products that meet the established quality level of acceptability without rework or repair.)
17. What was your average yield at final inspection in 2018? (Yield at final inspection = total number of boards passed at final inspection divided by the total number of boards started down the assembly process.)

%  

18. What was your defect rate in defects per million opportunities (DPMO) at testing (all testing) during 2018? (Defect rate in PPM = total number of defects divided by (components + solder joints) times 1,000,000.)

19. What was your defect rate in defects per million opportunities (DPMO) at final inspection during 2018? (Defect rate in PPM = total number of defects divided by (components + solder joints) times 1,000,000.)

20. What are your facility’s yield and DPMO targets?

Yield target %
DPMO target %

21. What types of quality controls do you have within your facility? (Check all that apply.)

Incoming Inspection
Solder Paste Inspection
Automated Optical Inspection
X-Ray Inspection
In-Circuit Test
Functional Test
In-Process Manual Inspection
Final Manual Inspection
22. If you utilize statistical process control (SPC) in your quality program, how often do you evaluate your control limits?

Annually
Semi-Annually
Quarterly
Monthly
Weekly
Daily
Continually
Other (please specify)

23. What are the internal yields of your key processes? (Yield as the percentage of units that make it all the way through the process without requiring analysis, repair or scrap.)

Surface Mount %
Wave Solder %
Selective Solder %

24. What was the average cost of poor quality (COPQ) as a percentage of gross sales in 2018?

Rework (Rework Cost / Gross Sales) %
Scrap (Scrap Cost / Gross Sales) %

25. If you are an OEM, does your company use or accept reworked boards?
26. If you are an EMS company, what percentage of your customers accept reworked boards?

\[
\text{\%}
\]

Section IV. Customer Satisfaction

27. Is there a measurement system in place to assess the customer’s perception of complete performance?

Yes
No

28. What was your rate of all customer returns in parts per million (PPM) in 2018? (PPM = number of units returned / number of units shipped * 1,000,000)

\[
\text{PPM}
\]

29. What was your rate of customer-returned items that failed, as a percent of total units shipped (NOT as a percent of returns) in 2018?

Zero KM (infant mortality, dead on arrival) %
Within 1-year warranty %
After 1 year %

30. What was your average rate of on-time delivery to customers (in percent) during 2018? (Percent on-time deliveries = number of orders fulfilled on time / total number of orders fulfilled.)
Section V: Supplier Performance

31. Did your company track *supplier performance* during 2018?

Yes
No

32. As a percentage of all orders received from suppliers:

a. What was the percent of on-time deliveries from PCB suppliers?

b. What was the percent of on-time deliveries from component suppliers?

c. What was the lot reject rate (in percent)?

Section VI: Certification

33. Certification

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<th>No plan to obtain</th>
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Please share any comments, questions or suggestions you have to improve this survey:

Click the SUBMIT button below to complete your survey. When it is successfully submitted, a thank-you page will appear that shows a copy of your completed survey as confirmation. It is suggested that you save your completed survey as a back-up. After submitting the survey, you will not be able to re-open it. If you need to make changes after submitting your survey, or if you have any questions, please contact Ms. Piyamart Holmgren at piyamartholmgren@ipc.org or +1 847-597-2868.