

Traceability: Solving Challenges & Adding Value in Electronics Manufacturing

What is Traceability?

Defined as the “ability to trace the history, application or location of an entity by means of recorded identifications,” traceability provides the necessary tools to enhance customer satisfaction while improving processes and reducing liability and error.

Information gathered through a traceability system can be used for process improvement, regulation compliance, direct or indirect cost savings, defect resolution, brand integrity and more. The residual benefits of traceability have garnered a great deal of attention within the electronics assembly industry during recent years. In terms of the increasingly complex nature of the supply chain there are a range of options to consider.

Why is Traceability So Critical?

Customer Expectations & Replacement: When it comes to covering the cost of replacement items manufacturers often ask supply chain partners to help shoulder the burden – a trend that is rapidly on the rise. Many OEM brands already have a legally binding agreement in place specifying the details of the supplier relationship, including financial and legal responsibilities for product failures, defects and other liabilities. The scope of exposure introduced through this type of agreement can pose a significant risk and should be evaluated thoroughly.

Productivity & Lean Challenges: Although implementation of a traceability system is often the result of consumer requests or contractual agreements, production teams themselves face enormous internal pressure to reduce cost through lean manufacturing processes. To achieve this, manufacturers must identify areas for improvement, isolating root causes to be addressed with corrective action. By providing the data needed to quickly attend to these issues, a traceability program can deliver significant quantitative benefits.

Early Detection of Defects: An average surface-mount technology production line presents more than 800 million opportunities for a process or component defects. Early detection is achieved by isolating impacted goods prior to shipping, allowing manufacturers to benefit from direct and indirect cost avoidances to justify the overall cost of a traceability system.

Regulatory Compliance: Managing compliance requirements that span into multiple vertical markets can be physically and intellectually demanding, requiring considerable manual labor and documentation. Compliance may additionally counteract lean manufacturing best practices while creating additional liabilities. Data captured from a traceability system can provide a simplified alignment process, reducing time and resources needed to capture the relevant information.

The Four Key Benefits of Traceability

Return on investment is one of the obvious primary concerns when it comes to the value of a traceability solution. There are four main areas where a manufacturer notices the most benefits:

1. **Production Efficiency.** In a typical environment, materials account for approximately 50% of the total cost. In electronics production however, the figure is actually closer to 80%. A traceability system offers more comprehensive data, allowing electronics manufacturers to error-proof processes and eliminate waste.
2. **Warranty/Recall Purposes.** Defective components and other liabilities can prompt major recall efforts. Consumer manufacturers spent an estimated \$16.7 billion in 2011 to process returned merchandise, with a staggering \$835 million in returned merchandise resulting from defective products. In light of the numbers, even a small improvement could have considerable impact of profit.
3. **Counterfeit/Unspecified Supply Chain.** An increasing threat to supply chain integrity, counterfeit incidents have increased by more than 240% over a three year period. A traceability system manages inbound inspection and supplier protocols with the ability to track data to verify that the inputs into production are not deviating from standard acceptance specifications.
4. **Regulatory Compliance.** With increasingly demanding environmental and process obligations, compliance demonstration for electronics manufacturers is often taxing and inefficient. Data and traceability systems can simplify and reduce the errors associated with these requirements. As more than 55% of electronics manufacturers label compliance reporting a major challenge, the accuracy and depth of a traceability system can be leveraged as a strong competitive advantage.

In Conclusion

As industry regulations and requirements surrounding warranty/refund programs continue to increase, traceability systems offer a way to improve processes, control the supply chain, minimize defect risk, navigate regulatory challenges and improve service levels. Although most are implemented due to consumer requirements, the benefits of a traceability system include improved visibility, efficiency and product quality.

Based on an original publication by Rob Prosser, Brady Corporation