

REPORT

Keysight Test Equipment Report

Keysight Survey Explores the Current Challenges to Achieving Electronic Hardware Manufacturing Quality

Keysight Technologies commissioned Dimensional Research to conduct a survey to understand the current challenges for achieving electronic hardware manufacturing quality. Additionally, the research sought to understand the habits of using and maintaining test equipment. The findings underscore the importance of test and measurement to ensure quality in electronic hardware manufacturing and the impact of quality on the bottom line.

Executive Summary

The research finds that ensuring quality for electronic hardware is getting significantly harder as nearly every company surveyed has already experienced a quality problem. Quality challenges originate from growing customer demands and tighter tolerances to increasing manufacturing complexity and pace. Quality problems track directly to the bottom line by increasing costs, stalling market momentum and disappointing customers.



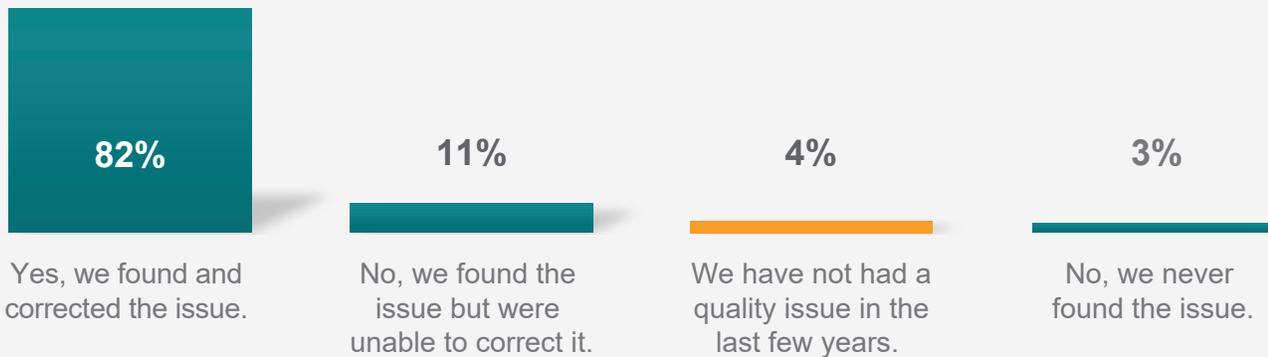
Nearly 9 out of 10 companies believe the risk of poor quality [manufacturing] can be contained with proper testing equipment.



The Results

Electronic hardware manufacturing supplying industries such as telecommunications and automotive have become increasingly complex. For example, autonomous vehicles require complex systems of connected sensors and electronics to help navigate and keep users entertained during their journey. In communications, technologies such as LTE and upcoming 5G enable devices to always be connected, monitored and controlled from anywhere, allowing anything and everything to work together including connected lightbulbs, power systems and industrial devices. The common denominator in these systems is highly sophisticated and precise electronics. The complexity and challenges in testing these products requires accuracy, repeatability, and reliability. Nearly 9 out of 10 companies believe the risk of poor quality can be contained with proper testing equipment.

For your company's most recent quality issue, were you able to identify and correct the quality issues?



According to the survey, 64% of respondents confirmed that ensuring product quality is growing more difficult. The increased complexity of electronics requires a comprehensive test strategy consisting of design, performance and operation to offer accurate, repeatable, and reliable results to measure quality.

Yet, that test strategy itself is complex. Survey respondents report a variety of factors that make maintaining quality a challenge such as the increasing speed of manufacturing, more demanding customer requirements, increasing metrics for quality, and tighter tolerances.

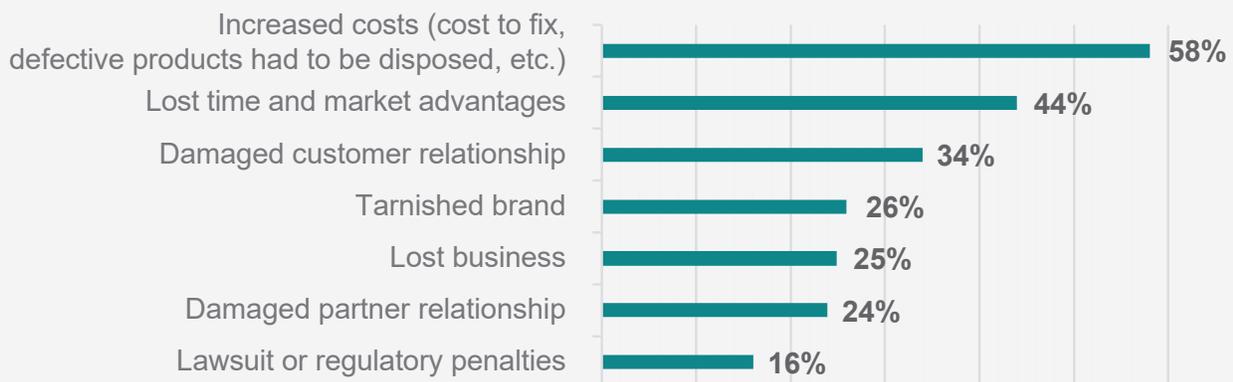
What is the biggest challenge to maintaining product quality today?



Poor Testing Practices Impact Product Quality and the Bottom Line

While extreme product quality issues can make headlines, 92% of survey respondents said that they suffer significant business impact from error-prone test equipment. Survey respondents report that quality issues frequently impact the bottom line, citing increased costs to repair or dispose of defective products and lost business, potential lawsuits and regulatory penalties, as well as lost time-to-market or market advantages, damaged customer relationships and a tarnished brand.

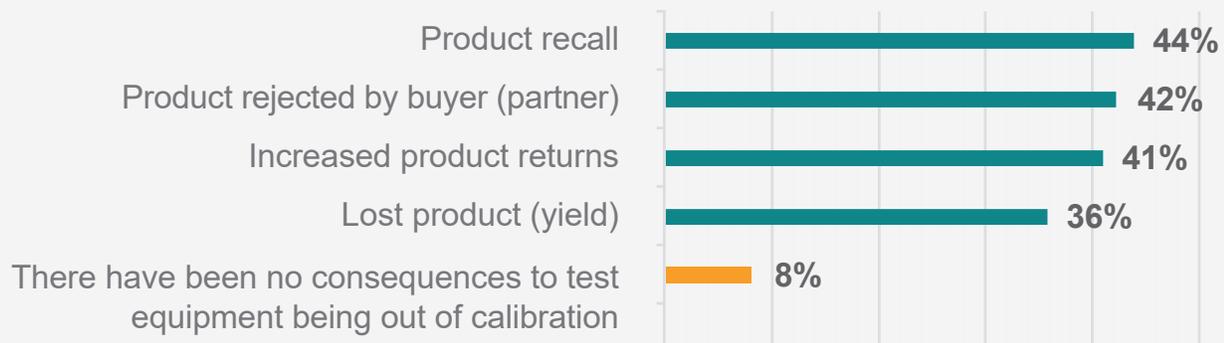
What was the business impact of the most recent quality issue?



Looking further into quality issues, survey respondents reported that testing equipment that is out of calibration has caused product rejection, recalls, loss and returns. Further, 49% of companies surveyed said that they lose \$100,000 or more for every 1% of yield lost.

Test and measurement in electronics manufacturing is increasingly complicated. Ultimately, a business and the quality of its products depends on a comprehensive test strategy with accurately calibrated equipment.

Which of the following has been caused by test equipment that was out of calibration?



Methodology

Keysight Technologies commissioned Dimensional Research to conduct this survey in the field. A total of 306 participants that use test equipment for ensuring electronic device quality and testing completed the survey. Participants were from all 5 continents. Senior quality professionals that test electronic equipment were invited to participate in a survey on quality challenges in manufacturing and testing. The survey was administered electronically, and participants were offered a token compensation for their participation.

About Keysight Technologies

Keysight Technologies, Inc. (NYSE: KEYS) is a leading technology company that helps enterprises, service providers and governments accelerate innovation to connect and secure the world. Keysight's solutions optimize networks and bring electronic products to market faster and at a lower cost with offerings from design simulation, to prototype validation, to manufacturing test, to optimization in networks and cloud environments. Customers span the worldwide communications ecosystem, aerospace and defense, automotive, energy, semiconductor and general electronics end markets. Keysight generated revenues of \$3.9B in fiscal year 2018. More information is available at www.keysight.com.

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

