CASE STUDY

Quality: A Vital Part of Medical Equipment THALES

Alvaro Munari, Head of Thales' IIR Production Line improved the quality of their product components with the help of Lean Six Sigma and Minitab Statistical Software.

KEY FACTS

ORGANIZATION

Thales

OVERVIEW

- Global technology leader
- Employs 68,000 people in over 50 countries

QUALITY CHALLENGE

Identify and fix the source of asymmetrical tube defects

PRODUCT USED

Minitab® Statistical Software

RESULTS

- Identified optimal settings
- Improved process capability from a Cpk of 0.49 to 1.13

The XRIS business unit of the Thales Electron Devices Division produces electro-optical equipment for the medical, scientific, defense, and telecommunications industries. In particular, healthcare practitioners use radiological equipment, which includes Thales X-Ray image intensifiers, to perform fine diagnostic and delicate clinical procedures, so preventing risk to patients and professionals alike is critical.

That makes quality a vital concern for Alvaro Munari, who is responsible for Thales XRIS's medical physics service. His team's role in the process chain is to ensure that the quality of their parts contributes to an excellent final product, and they use Minitab Statistical Software to monitor, maintain and demonstrate this high level of quality.

Challenge

When the company discovered that the electronic tubes they were producing as a critical part of their medical radiography equipment were asymmetrical and didn't meet customer specifications, Munari's team launched a Lean Six Sigma project to identify and fix the source of the problem.

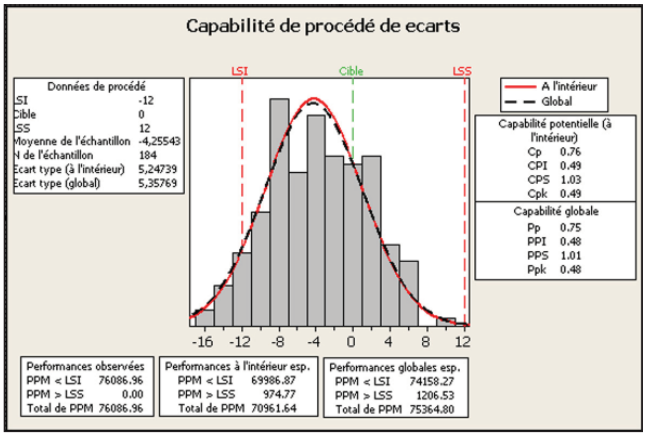
How Minitab Helped

The team used Minitab's Gage R&R feature to validate the reliability of their measurement system. Then they analyzed the initial capability of the tube production process using Capability Analysis. With a Cpk of only 0.49, they knew they needed to improve the process and reduce the number of defective tubes.

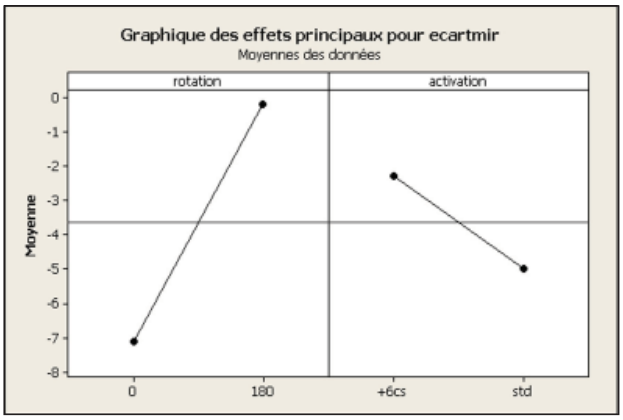
By analyzing the process data, the team determined potential causes of the problem including the rotation of a screen inserted inside the tube to transform photons into electrons, the activation (the cycle time), and possibly the machine used to set the screen properties.

They then used Minitab's Design of Experiments capabilities to explore the interaction and effects of each factor. The data collected in their test runs was analyzed and graphed using Minitab, making it easy for them to define the best settings for each factor. They found that rotating the screen by 180° had a strong influence on the results, whereas increasing the cycle time to six minutes was less influential. The team then created Xbar-S charts in Minitab to evaluate the effectiveness of the changes they made at each stage of the process.

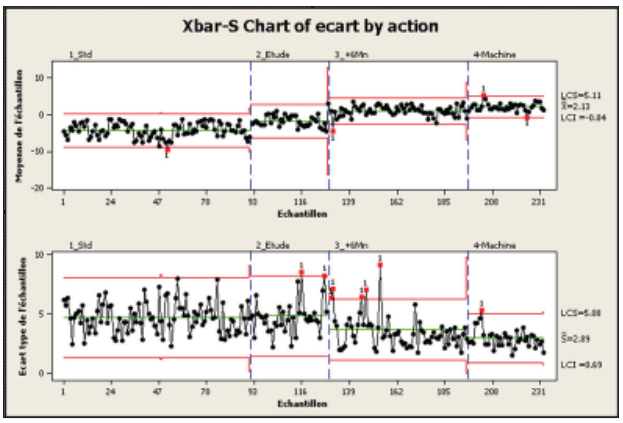
The team addressed 54% of the detected asymmetry problems and therefore the Cpk capability statistic got a lot better. To improve the Cpk even more, the team bought a new machine to replace the existing one which had reached its maximum life time.



Minitab's capability analysis indicated a short term capacity of 0.49 showing the process capability requires some improvement efforts.



The Minitab main effects plot was used to compare the relative strength of the effects across the screen rotation and the activation process length factors.



The Minitab Xbar-S chart helped the team to evaluate the effectiveness of the changes made at each stage of the process.

Results

The team's analysis and experiments, completed with the help of Minitab Statistical Software, explained 54% of the asymmetry problems and significantly increased the process capability from a Cpk of 0.49 to 1.13. Changing the machine and rotating the screen by 180° reduced asymmetry enough to meet customer expectations. Not only was Thales able to meet these customer specifications, but the tubes made using the improved process were incorporated into the equipment without adversely affecting the overall quality of the finished product.