



Rework Reduction in KHS machinery Pvt. Ltd.

Dharmil Bavishi, Juhi Gupta, Gaurav Banthia, Parul Maroo, Richa Grover.
Industrial Engineering, Pandit Deendayal Petroleum University



Mentor- Dr. Himanshu Trivedi
Guide- Mr. Parth Raval

About KHS

KHS is considered a technological leader in filling and packaging technology throughout the beverage industry. The market position of KHS as an innovator has risen by the recent developments including innovative modular packaging solutions, universal filling systems, high performance labelling technology, cutting edge communication and diagnostic technologies and much more.

Problem Statement:

1. Being a project based company wherein the lead times of manufacturing a machine goes from a month to a year, KHS needs to have tight scrutiny towards the deadlines.
2. Each machines consist of 100-1000 assemblies.
3. With a single component rework it hampers the entire assembly line.
4. Thus the effect tends to be exponential when a critical component goes for rework.
5. So the aim of the project was to reduce the rework operations to reduce the lead time, Cost of Quality and proper utilization of human and material resources.

Methodology:

1. Our first task was to understand the reworks that occurred since last 5 years in different machines.
2. By understanding the various reworks, our next step was to identify which all machines contributed to maximum rework.
3. On the basis of Pareto Analysis; we came to know the top 3 machines that constitutes the maximum rework. The data was analyzed on the 5 years of rework history.
4. So out of a lot of 8-9 machines that are produced annually by the company, we focused on top 3 machines; that accounted maximum rework.
5. Solving this will lead to greater relief to the company in terms of costs, man-hour loss and resources optimization

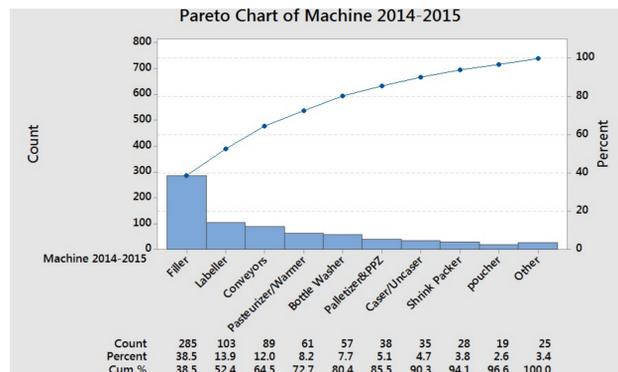


Fig-1 pareto chart of machine 2014-2015

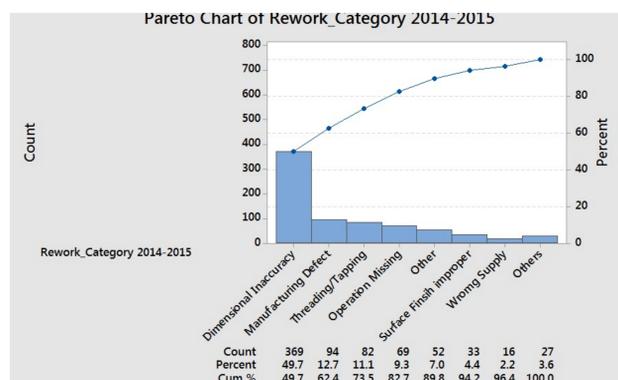


Fig-2 pareto chart of rework category 2014-2015

Why-Why Analysis

1. After performing Pareto; the next step was to understand the reason for repeatability of reworks taking place and steps of actions taken to solve it.
2. This will help us to identify the reason associated to the reworks and will also help the company to go through the certain protocols to avoid future problems related to rework.
3. So basically we circulated a questionnaire containing 12 questions related to rework problems to the heads of the departments.
4. We get to know that major issue faced by rework is the frequent occurrence of similar component for rework

Cause and effect Analysis

1. Thus on the basis of inputs of Why-Why analysis and Pareto we tried to figure out the Real Cause of reworks.
2. We identified that certain components which were responsible for frequent reworks are characterized by similar problems when purchased from vendor.
3. On the Cause and Effect Diagram you can see the results.
4. Also Certain other parameters were also responsible for the rework problems

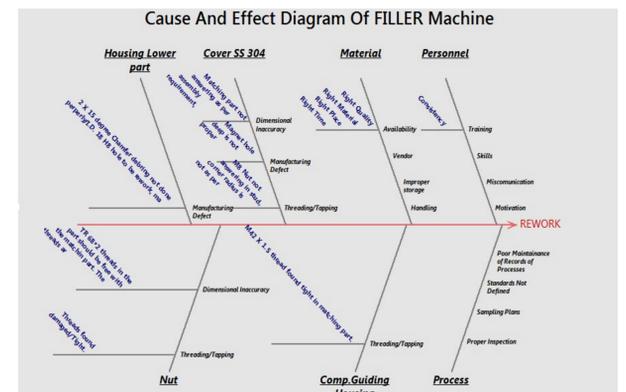


Fig-3 Cause and Effect Diagram of FILLER Machine

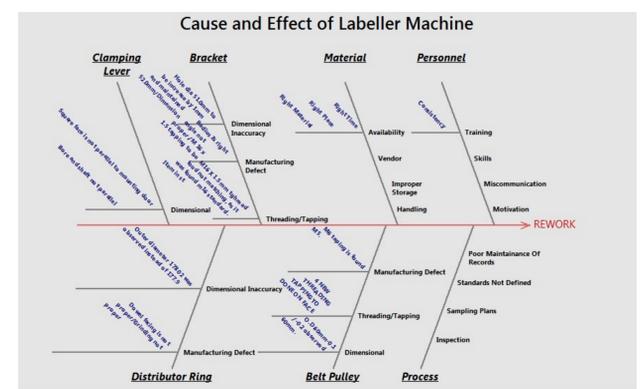


Fig-4 Cause and Effect of labeller machine

Suggestions to company

1. **Height (Dimensional Inaccuracy):**
Using Sine bar
Using Vernier height gauge
Using Digital height gauge
Using electronic height gauge
2. **Lack of material availability:**
By ordering all the components beforehand so that there is no issue at the time of rework or
By maintaining enough buffers. In such case procurement officer or the person in charge should keep updated records of inventory.
3. **Fits and Tolerances:**
ISO Tolerance Systems for Limits And Fits and Fits and tolerance calculator.

Conclusion

The analysis was more focused on the critical and most occurring reworks; eliminating such rework practices would help the company to have great utilization of resources and meeting the customer delivery time will enhance the growth of the company. After focusing on the major chunk of the problem the company should focus on remaining problems to be a global leader in packaging and filler industry.