Scrap Reduction on Anodize Treatment Area

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Abstract

MD Company encounters significant challenges within its anodizing process, characterized by pronounced waste generation. Proposing an integrated approach merging Lean manufacturing principles with DMAIC methodology to mitigate this issue. Over a span of 110 days, the research extensively addresses waste reduction and enhancements in operational efficiency, employing methodologies such as Pareto analysis and the 5 Whys technique. Literature review underscores the criticality of efficient processes and the indispensability of Lean Six Sigma tools. The implementation of DMAIC serves to meticulously identify, analyze, improve, and control the problem. Noteworthy findings culminate in a remarkable 25% reduction in waste, underpinning MD Company's unwavering commitment to sustained operational excellence. This achievement further cements MD Company's position as a pioneering force within the industry, exemplifying its dedication to pioneering and perpetuating innovative manufacturing practices.

Key Terms- *DMAIC method, Scrap, Waste reduction, 5s.*

Problem

In the last year, MD has experienced a considerable loss due to this problem, with a total of 6,090,716 units of scrap produced. This situation not only represents a significant economic loss for the company, but also jeopardizes its ability to meet market demand and maintain its competitiveness in the medical industry. It is therefore imperative to effectively address this problem and develop solutions that will improve the efficiency of the anodizing process and reduce unit waste, thus ensuring MD Company's sustainability and continued success in the global healthcare market.

Methodology

For the methodology of this study, the DMAIC (Define, Measure, Analyze, Improve and Control) approach will be followed to address the problem of scrap waste in the Anodizing Treatment Area of the MD company. In the Define phase, the Voice of the Customer will be used to understand the needs and expectations, thus providing a solid basis for problem identification. In the Measure phase, a Process Map will be used to visualize the process flow and specific data will be collected at each stage, allowing a detailed assessment of waste in each process. In the Analyze phase, the 5 Whys and an Ishikawa diagram will be applied to identify and understand the underlying causes of scrap waste, which will help develop effective solutions. In the Improvement phase, improvement will be measured through post-implementation testing of alternatives based on the identified needs, highlighting the importance of measuring the impact of the proposed solutions. Finally, in the Control phase, the most viable alternatives will be recommended to maintain the proposed improvement, thus ensuring a continuous and sustainable improvement in the Anodizing process. This structured and systematic approach will ensure a thorough understanding of the problem and facilitate the implementation of effective solutions to reduce scrap waste in the MD company.

Stage	Purpose
Define	Define the process and establish goal
Measure	Measure to determine process needs
Analyze	Analyze the data to find the results
Improve	Implementing selected solutions to address root causes
Control	Monitoring performance metrics and ensuring sustained improvements

Table 1: DMAIC Stages

Results and Discussion

DEFINE PHASE

Figure 1: VOC

VOC (Voice of Customer)

Dear Anodizing Area Team,

We are writing to express our concern regarding the parts demand fulfillment and scrap issues experienced in the production of Product A. In recent weeks, we have noticed a significant discrepancy between the quantity of parts supplied and the quantity required, as well as a noticeable increase in scrap levels on Product A parts received.

Specific observations:

1. Insufficient quantity of parts: We are regularly receiving less than the required quantity of parts to fill scheduled orders for Product A. We are receiving less than the required quantity of parts to fill scheduled orders for Product A. This is resulting in production delays and is ultimately negatively impacting the ability to meet customer demands for Product A.

2. Impact on our efficiency: Delays in the delivery of Product A parts are causing disruptions in our packaging process. This forces us to halt our operations, resulting in unplanned downtime and reduced operational efficiency in the Product A packaging area.

Required actions:

1. Scrap Reduction: It is requested to implement immediate measures to reduce scrap levels in the Product A parts produced. This is critical to ensure the delivery of high-quality parts that meet standards and allow for proper workflow in the Product A packaging process.

2. Improved communication: Smooth and proactive communication between the areas involved is crucial to address any Product A quality and supply issues in a timely and effective manner.

Next Steps: These concerns are expected to be discussed in a joint meeting to explore solutions and establish necessary corrective actions for Product A. The goal is to work together to ensure an efficient supply chain, with high quality Product A parts, and to optimally meet customer needs.

A prompt response is expected in order to schedule a meeting. We appreciate your attention and cooperation in this matter.

Cordially,

Packaging Area

MEASURE PHASE

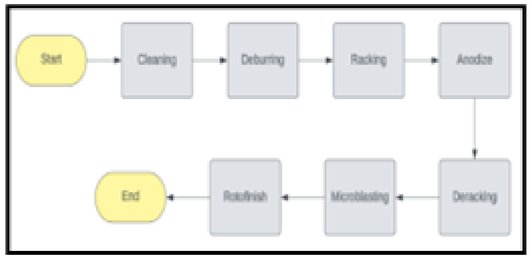

Figure 2: Process Map

	Scraps	Units	Percent
Tanks	Rack Marks	556,464	18%
	Loss in Tanks	1,013,646	33%
DeRacking	Irregular Treatment	281,360	9%
	Derracking Loss Material	370,736	12%
Racking	Deformed Units	422,040	14%
	Coating Defects	411,547	13%
	Total	3,055,793	100%

Table 2: Summary of Most Significance Scraps

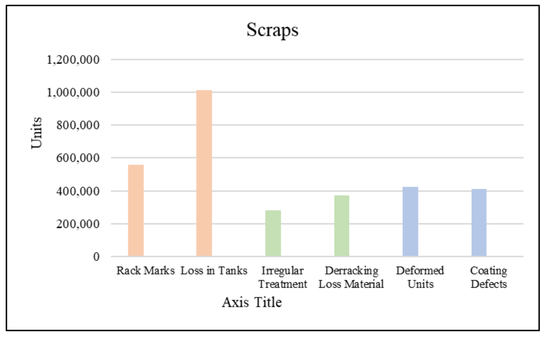

Figure 3: Pareto Diagram of Significance Scrap

Total Scrap Units Per Year	
Scrap	**Quantity**
Loss in Tanks	1,013,646
Rack Marks	556,464
Deformed Units	422,040
Other Deracking and Racking Scraps	1,063,643
Scraps not in Scope	609,059

Table 4: Most Relevant Scrap Data Collected

ANALYZE PHASE

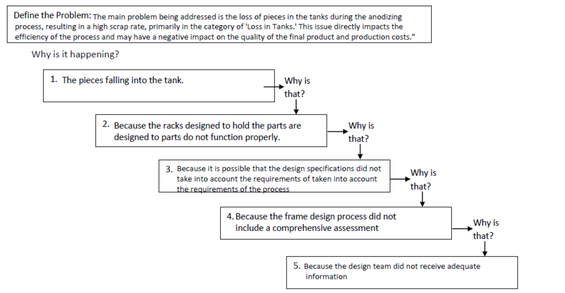

Figure 4: 5 Whys for Loss in Tanks

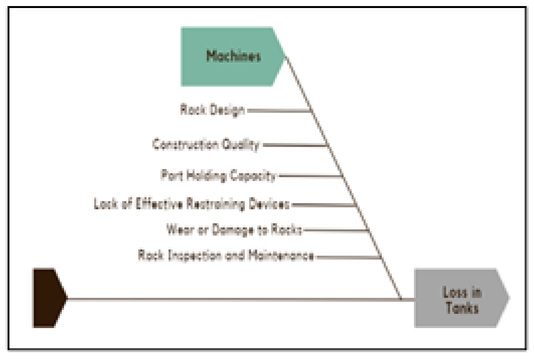

Figure 5: Ishikawa Diagram for Loss in Tanks

IMPROVE PHASE

Figure 6: Rack

Figure 7: Basket

	First Shift	
	Comparison Table	
	Rack	Basket
Loss in Tanks	1,190	892
Total	1,190	892

Table 5: First Shift Scrap Collected

	Second Shift	
	Comparison Table	
	Rack	Basket
Loss in Tanks	1,236	927
Total	1,236	927

Table 6: Second Shift Scrap Collected

	Third Shift	
	Comparison Table	
	Rack	Basket
Loss in Tanks	1,372	1,029
Total	1,372	1,029

Table 7: Third Shift Scrap Collected

CONTROL PHASE

Control Measures	
Training	The company is committed to ensuring that staff members are fully trained in the use of the new canastas and related procedures. Consequently, in order to ensure that every team member is ready to use these tools effectively and adhere to established procedures, exhaustive training is being provided. The company firmly believes that competent staff is essential to the success of any implementation.
Auditors	The company understands how important it is to regularly check that established standards and procedures are being followed, as well as to identify any deviations or potential issues. Thus, in order to evaluate the performance of the process and ensure that the implementation is working properly, periodic audits are being carried out. These evaluations will provide useful information to provide opportunities for correction and continue to improve the anodizing process.

Table 8: Control Measures

Conclusions

Based on a thorough analysis of the test runs performed, the organization is pleased to report that it has achieved a remarkable accomplishment by reducing the level of scrap by an impressive 25%. This result far exceeds initial expectations, demonstrating the effectiveness of the strategic measures implemented. This milestone not only leads to significant improvements in the efficiency of the anodizing process, but also generates positive impacts on cost optimization and overall customer satisfaction.

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