

Author: John Rosado Miranda B.S in Biology  
 Advisor: Carlos Pons Fontana Ph.D, PE  
 Department of Industrial Engineering

## Abstract

The implementation of a continuous improvement and application of the 5'S in a medical device company was specifically developed in the warehouse area (spare parts) and focused on the identification of materials, order and cleaning in order to achieve Certification of the ISO 9001: 2000 Quality Platform referring to quality and good customer service. The main objective of this project was to carry out inspections in the area of the warehouse to observe the existing deficiencies and improve them based on the 5'S and Kaizen methodology applied to the warehouse.

## Introduction

The most successful companies are never satisfied with the status quo. They constantly have their eye on the next innovation, the next level of performance. They know the importance of continuous improvement in all areas of the business. Even if things are going perfectly, they are looking at what could be improved upon so that they can perform better. They are finding ways to work smarter not harder in order to be more efficient and profitable. The most successful companies are always innovating and developing new ways to deliver top-notch quality to their customers.

## Background

The 5S methodology was developed in Japan with the focus on optimizing the organization of the workplace. The methodology is called '5S' because it comprises of 5 steps: Seiri, Seiton, Seiso, Seiketsu and Shitsuke. Translated into English: Sort, Set in Order, Shine, Standardize and Sustain. By implementing the 5S methodology and its standards, organizations can increase their efficiency and effectiveness by re-organizing the workplace and eliminating waste. The key aspect is to introduce a standardized workplace organization process. If implemented correctly, this method can also help project managers and project teams save time, budget and effort.

## Problem

The project will carry out an evaluation of a spare parts warehouse located in a medical device company. When making a review visit in the spare parts warehouse within the medical device company to know the current situation, it was possible to detect the poor organization, since the area was in a mess and dirt situation. There are boxes on the ground that obstruct the flow of personnel and material. It was also found that the merchandise is not classified or located in a way that makes it easy to quickly find all products, thus making it impossible Efficiency for obtaining inputs. A lot of dust was also observed on the shelves and boxes. In the last inventory made to the warehouse of internal consumption, a percentage of loss of 2.5% was disclosed, exceeding the percentage of loss of 1% allowed within the margin established by the company's management. given the observations it was possible to define the following problem: There is a need to implement a methodology that eliminates disorganization, poor product location and dirt in the spare parts warehouse.

## Methodology

The following steps explain the process used to conduct the 5S implementation at the spare parts warehouse.



### Step 1- Implementation of the first S (Select)

At this stage we proceed to select and separate material or objects that are not designated to be used. In the case of the object of study analyzed, it was selected. all material or product that is used less frequently, taking into consideration that the necessary objects are rearranged and maintained only with the necessary quantities.

### Step-2 Implementation of the second S (Sort)

In order to order the location of the products within the warehouse, a list was prepared with all the types of products that are handled in it. In the list, each item was classified by department, to later decide on its location within the warehouse.

### Step-3 Implementation of the third S (Clean)

Keeping the installation clean will help us keep it in good condition, for this it was defined what is required to clean inside the warehouse, how often it should be done, and assign the person or persons who will be responsible for such cleaning activities .

### Step-4 Implementation of the fourth S (Standardize)

In order to maintain all the progress made in the warehouse, a standardization must be created regarding the activities previously carried out.

### Step-5 Implementation of the fifth S (Follow-Up)

To follow up on order and cleanliness, this stage is based on managing to develop in the staff a self-discipline and culture in the work area, where everyone must participate actively, because it is not only about momentary actions, but about following up until arriving to a habit, always waiting for the results to be positive and turn the workplace into a simple space to work more effectively.



Current warehouse situation

## Results and Discussion

Next, the results obtained after the 5S's methodology are presented and mention is made of the evidence resulting from the joint effort, both by the operators and the trainer.

Adapting the activities of the selection stage, according to the characteristics and needs of the warehouse, the format of the red card was placed to the selected elements as not necessary for any operation in the warehouse.



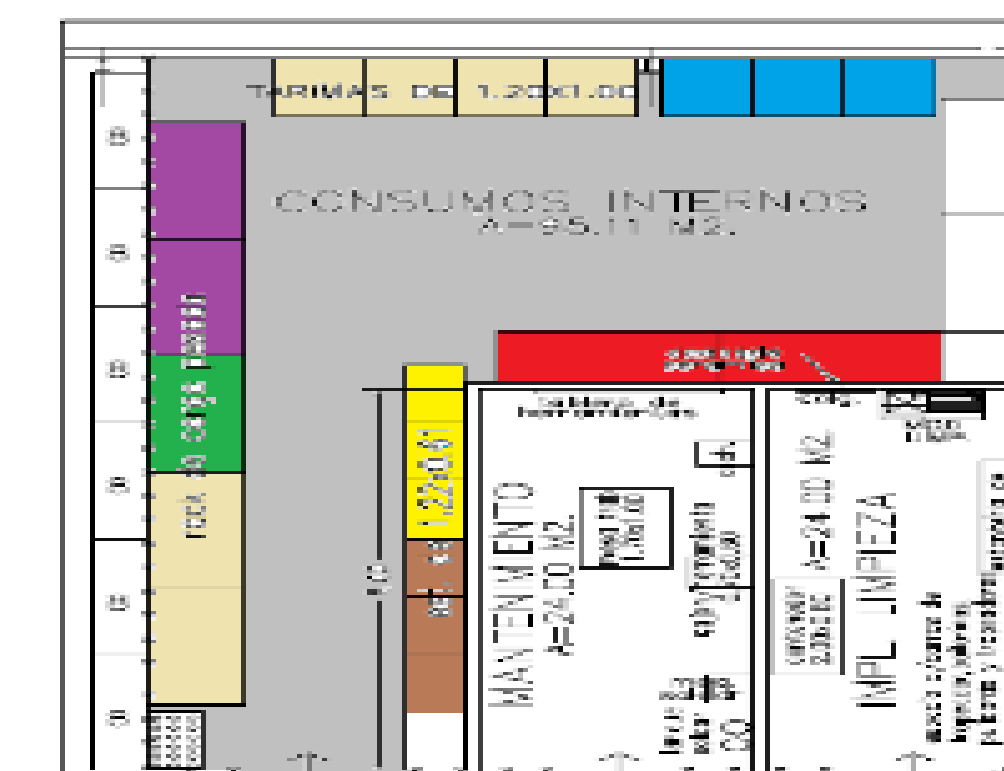
Red Tag

Prior to the implementation of the first S, the order stage was applied, and a classification of the 99 products within the warehouse was obtained divided by departments to facilitate the accommodation of the products .

COLORS	COLOR CODES FOR SPARE PARTS
Blue	CALIBRATION
Green	LEGACY
Yellow	ENGINEERING
Red	MESSANIE
Purple	CHEMISTRY
Orange	MANUFACTURING
White	FINANCE

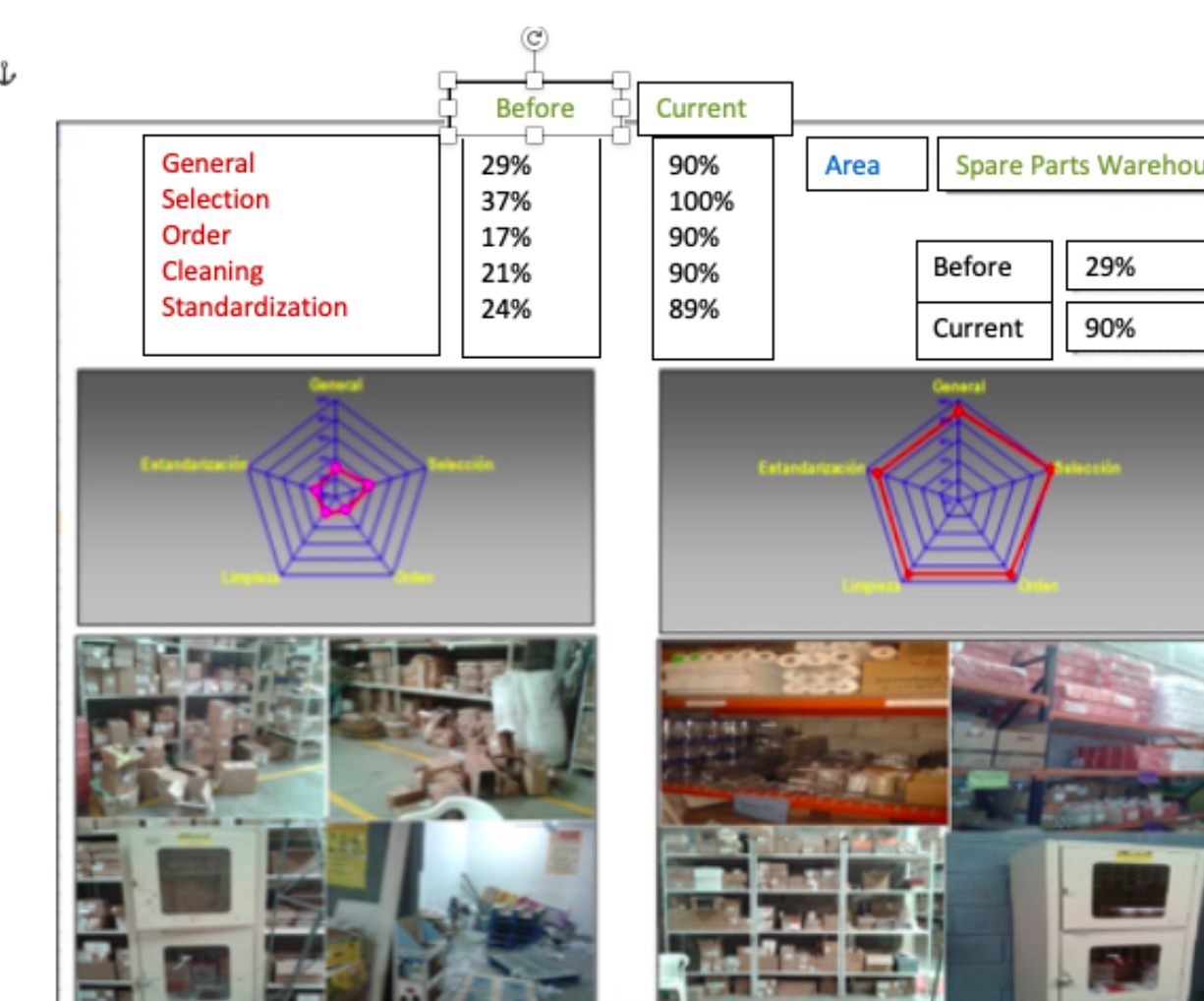
Color codes

After classifying each product in the warehouse by department, a color was assigned to each classification, to help improve their location.



Encoded Layout

The results obtained after applying the 5S are presented below:



Before and after 5S

## Conclusions

The objective proposed during this project was to organize the spare parts warehouse, applying the 5S methodology to obtain a clean and orderly vision. In order to achieve the certification of the ISO 9001: 2000 quality platform in reference to quality and good customer service. Thus improving their activities in the organization. Thanks to the participation of the personnel working in the warehouse, it was possible to apply the 5S methodology and fulfill the objective, since their collaboration was very important during the entire time of the implementation.

## Future Work

Next July 2020 an audit will be carried out in the spare parts warehouse to confirm that all the implementations that were carried out in the 5S project are being fulfilled.

## Acknowledgements

Thanks to Dr. Carlos Pons for his unconditional help in the process of carrying out the project. Thanks to Elian Lopez, Industrial Engineer of the company for the trust and support she gave me and John Ortiz, in charge of the spare parts warehouse, who was assisting me throughout the process. Without your help this project would not have been possible. Thank you!

## References

- Feigenbaum, A. (2000). Control total de la calidad. Compañia Editorial Continenta.
- Hirano, I. (1997). 5 S's para todos: 5 pilares de las fabricas visuales. Editorial Norma.
- Imai, M. (1998). Como implementar el Kaizen en el sitio de trabajo. Editorial McGraw-Hill
- Lefcovich, L. (2003). Lean Management. Editorial Profit.
- Liker, K.J.(2006). Las claves del exito Toyota. Editorial Gestion 2000RAN
- Maurer, R. (2007). El camino del kaizen. Ediciones B.
- Miranda, F. J., Mera, A., & Rubio, S. (2007). Introducción a la gestión de la calidad. Delta Publicaciones.
- Ohno, T.(2003). Las tres revoluciones. Galgano Editores