

Optimization of Packaging Solution

-The case of Trelleborg AB

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Abstract

Trelleborg Sealing Profiles is part of the Trelleborg Group, which is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. With a goal of having high customer satisfaction, and a high productivity in the production to a low cost, was this master thesis created.

The purpose of the project is to investigate how the packages used in one of Trelleborgs factories can be changed to decrease the cost for the packages, and also reduce the handling time for the package. With handling time means the time it takes from the operator starts assembling the package until it finally is stacked on pallet. The result of this study is a new package developed by the authors in collaboration with a world leading packaging company, Smurfit Kappa. The new package resulted into reduced material cost and reduction of the handling time with 87 percent.

Introduction

This project is based on one of Trelleborgs factories that produce gaskets in TPE and PVC polymers. Their customers are mainly operating in the automotive and construction sector.

Trelleborg wanted an investigation of their packaging unit with the goal of reduce the time that the operators are dealing with packages, later called the handling time, and also wanted a reduction of the costs that can be linked to the packages.

The current situation in the factory is that the operators assemble the package by hand. The package is build from several parts, which has resulted in a long handling time for the packages. Depending on the order volume, several production lines with this product are running.

Existing package

The existing package is made from fanfold cardboard. The process to make a complete package starts with that the operator cuts the fanfold sheet into the length that the finished box shall have. This length is typically 10 centimetres longer than the gasket that shall be packed. The operator then fold the sheet to a box shape with his hands and add the gables with a staple gun. The process to make the box takes 60 seconds.

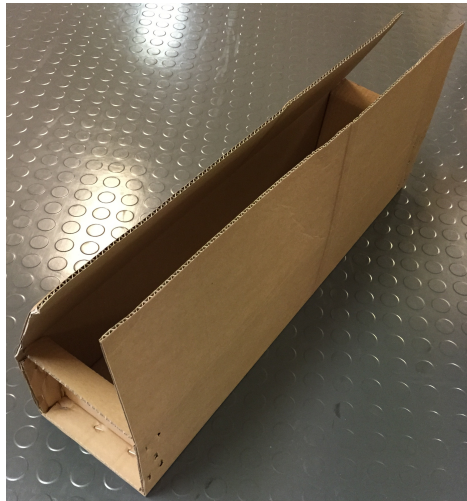


Figure 1 Previous box

The advantage with the existing package is that the length of the box can be adjusted due to how long the gasket is. Nevertheless is there a need to make the box a little bit longer than the gasket to ensure that the gasket easily can fall into the box in the filling process, which is performed automatically within the machine.

Brainstorming

After visits and observations in the factory, a brainstorming process is initiated. Even other packaging materials than cardboard are considered. Some of the evaluated packaging solutions are plastic tubes, bulk transportation i.e. using pallet collars and also increased volume of the existing package. An important regulation to consider when making changes of the size of the package is that the package is not allowed to exceed a maximum weight of 15 kilos if it will be handled manually [1]. Also an automation of the packaging process is evaluated. To get more influences and to see what types of packages that is on the market, are leading packaging companies as Smurfit Kappa and DS Smith contacted. Also contacts with companies that purely

offering packaging machines are established.

New solution

The first step in finding a new solution is to standardize the length of the packages. The production data for the previous year are studied and it is determined that some of the lengths of the produced gaskets are more common than others. It is therefore possible to transform this into five lengths that become the lengths of the new gaskets.

After the standardization of the packages, are a new series of packages developed in collaboration with Smurfit Kappa. The goal with the new packages is to reduce the handling time for the operators. Three types of packages with different folding and sealing mechanism are developed. All three packages have their own advantages that later are combined in the final solution. The result is the package illustrated below.



Figure 2 New box developed with Smurfit Kappa

If the packaging process is transformed to an automatic process is there even larger savings to receive in terms of handling time. With an automatic process is it possible to increase the production volume and reduce one production

line. Therefore is an investment in a fully automatic packaging machine investigated. This machine will further reduce the handling time needed by the operators to approximately 5-8 minutes per hour.

Analyse

Cost calculations and investigations in how the package fulfils the utilization of the package is performed. Purchasing data are requested and request for quotation is sent on the new package. This shows that the new package decreases the material cost significantly. The investment that are needed to implement the new packaging solution is low due to the cost savings that will occur in material savings and the payback [2] is calculated to 0.6 year without considering the savings in handling time.

The utilization rate of the package is calculated using a computer-based program named Cape Pack [3]. Cape Pack calculates the area utilization of the pallets used by Trelleborg. It is important to achieve a high utilization of the pallet to minimize the cost in the supply chain. The calculations show that the area efficiency for the new package is approximately 93 percent.

The fully automatic solution has a large investment cost. To make this solution profitable is it required to either close one production line or make rearrangements in the production to save labour costs. With a fully automatic machine is it possible to separate the production from the packaging process. This has a major advantage and makes the system more dynamic. If problems occur in the packaging unit is not the

production affected. After the financial data for the fully automatic machine has been compiled, it is determined that the payback time for this solution is 2.7 years if one production line can be reduced.

Conclusion

The conclusion of this study is that the new packages have great advantages and they can easily be implemented. They will have a small influence on the supply chain and the way the customers handle the package, since they have the same cross section area as the previous package. The new packages both saves material cost and reduces the handling time with 87 percent. The fully automatic machine generates even larger reduction of the handling time and also has other advantages as the possibility to separate the packaging unit from the production.

References

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