

# Production layout and improvements of operations at Purus AB

## - guidelines for rational logistics

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*This article is based on a master thesis written at the Department of Engineering Logistics, Lund Institute of Technology during the autumn and winter 2010 – 2011. The objective of the work was to map Purus' current inventory control and to present operations enhancements and a smart layout for the newly acquired production building in Ystad. To be able to meet the objective, suitable theoretical logistics frameworks were applied on Purus' situation and solid layout procedure was used.*

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### Introduction

Today's plastic market is complex and involves heavy competition from companies all over the world. It is not anymore a matter of producing as much as possible; it is rather a concern of producing and distributing as efficient and flexible as possible. To stand the competition and to continue to grow it is crucial to have a rational and effective inventory control.

### Background

Purus AB has the last couple of years grown tremendously within the market of drainage solutions for wet rooms and shower areas. To possibly grow even larger and to have a more efficient logistics, the purchase of a large production building in Ystad, Sweden was necessary. The company had become too big and too complex to function well in the spaced, old, and small buildings in Sjöbo, Sweden. The growth has to the majority been reached by acquisitions of competitors

and nowadays Purus dominates the Scandinavian market with a share of about 90 % in some areas. A future expansion is expected and desired and within 5 years they plan to have doubled their production. This will probably happen internally, meaning growing within today's organizational structure, because Purus cannot buy more brands without to risk creating a monopoly market.

In Sjöbo Purus has been characterized by a complex logistics structure and scarce control over inventory. The company has a massive product catalogue and the logistics is managed in a deficient ERP and with old fashion tools. The purchase and restoration of one big production building enables Purus to expand, to get better control, and to smooth the flow of materials.

### Purpose and problem definition

The purpose of this thesis was to analyze Purus' current production and logistics and to come up with suitable

improvements and arrangements that would fit the newly acquired site. This involves first applying theoretical frameworks regarding inventory control, so that it is then possible to design a rational, efficient, and flexible layout.

### **Focus and delimitations**

The main focus of this study was to develop a layout for the new factory in Ystad. Together with Purus, several layouts were discussed and evaluated. Different levels of layouts were discussed, both an overview of the whole factory as well as detailed layouts of some of the functions. In addition to this the study also discusses some general logistical improvements that could be made. This study is limited to look at and analyze the situation at Purus Sjöbo, which makes the layouting part of the results heavily limited to the company in question. The general discussions concerning logistical improvements however, could probably be translated to other manufacturing companies.

### **Methodology**

In order to get an overview of the company and the problem, interviews were conducted with management and employees, and observations were made in the production. After this initial step more detailed information was obtained via the ERP. This data provides the foundation for the analyses and conclusions made throughout the study. The data was continuously run with responsible personnel to avoid anomalies. This triangulation also raised the validity and reliability of the report.

### **Theoretical frame of reference**

There are two basic ways of which one can control its inventory. Material Requirements Planning is a computerized method that gives the logistics manager directions on what to order and when. This program tends to “push” materials and products through the system, meaning it plans according to forecasts and expected demand. The other philosophy, called Just in Time, instead “pulls” materials, meaning it does not react until there is an actual demand. These methods does not have to exclude each other, instead they can beneficially be used in symbiosis. Often one uses Material Requirements Planning as an overall planner, but uses kanbans, a Just in Time tool, in certain areas.<sup>1</sup>

To reach better overview and control over a large product catalogue it can be valuable to classify the different products according to certain criteria. A traditional way to segment products is to divide them into three groups according to how much they each are produced and valued. In general products follow Pareto’s principle meaning that a low portion of the articles stand for the majority of sold quantity. The classification into A, B, and C groups can also be done based on for example order frequency. Then the different segments can be managed differently in the supply chain. In general it is profitable to control A-products stricter with smaller lot sizes and more frequent orders. Depending on what class a product belongs to can also serve as a

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<sup>1</sup> Nahmias, 364-365

guideline for what place it should have in the storage.<sup>2</sup>

When designing a production building a good procedure to follow is a method called Systematical Layout Planning. It is a tool that is built up in eight steps leading to a detailed layout of the site. The framework takes stand in the current inventory control and designs a production layout that performs well according to relevant and valuable criteria.<sup>3</sup>

### Empirical Findings

Purus has today a complex and large logistical structure. In Sjöbo the company has had problems knowing where and in what quantity materials are stocked, and consequentially having a hard time planning the material flow correctly. The current business system provides little help for the logistics planner in terms of what to order and when. Kanbans are used sparsely in the organization but yet successively where they do exist.

The authors were able to extract a lot of data from the ERP regarding how things are run and functioning. It was shown that the products in the storages could be divided according to Pareto's principle and that order quantities were fluctuating a lot. The flow of materials from various locations was mapped and lead times were documented. The flow chart showed that Purus' production is sprawled meaning that finished products can have been built up at many various sites around the country.

The empirical studies also concluded that Purus, in Sjöbo, has had large volumes of inventory. Large to such an extent that the company is able to not only provide customers with what they want within just one day, but also provide them with spare parts to products that have not been in the product catalogue for many years.

### Conclusion

To achieve better control and more profitable steering on the material flows Purus should invest in a better ERP with a solid Material Requirements Planning system. This in combination with extended use of kanbans and a logistics manager with freedom of action will run the inventory control better than today.

The products were at a both semi finished and finished level divided into A, B, and C groups depending on how much money that was tied to them. An A-classed product should be run tighter than a lower classed one. The segmentation should then in combination with the order frequency lists, provided by the authors, determine how beneficial placement the product should have in the storage.

To sharpen up the operations a couple of JIT tools should be implemented. SMED will enable smaller lot-sizes and a more flexible production. The 5S will gain control over materials and tools and provide a nicer work atmosphere.

The eight steps in Systematic Layout Planning lead to a detailed layout over the Ystad site. Some of the steps were repeated to get a detailed layout over the machine park specifically. The authors of this master thesis provided

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<sup>2</sup> Jonsson, Mattson 510-511

<sup>3</sup> Lennys bok

the company with two just slightly different layout proposals. These building designs are good in regards of certain layout criteria like transportation of pallets, organization overview, esthetics, and work environment. Below in figure 1 and 2 are one overall layout and one on the machine park exclusively presented.

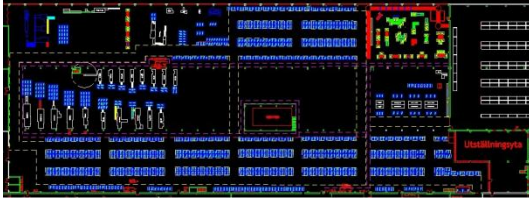


Figure 1 Overall layout.

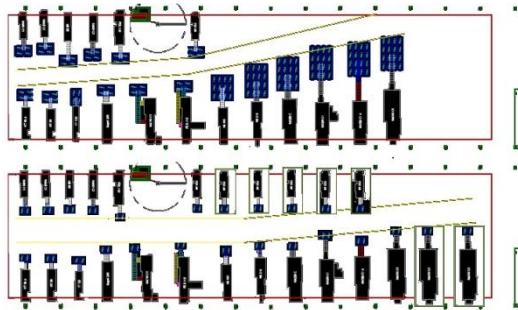


Figure 2 Layout of the machine park.

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