Optimization of kitting process: A case study of Dynapac Compaction Equipment AB

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Abstract

A case study has been done at Dynapac Compaction Equipment AB in Karlskrona in order to improve the internal flow of the production. The “Supermarket Storage”, an adjoining storage that feed material to the lean production in the “Z-line” assembly line with the help of kitting, was chosen to be focused during the optimization of the internal flow. Also, due to the little academic research about kitting it was decided to focus the research on the kitting process and identify how to optimize it.

The purpose of the research is to determine optimization methods of a kitting process and fill in the kitting optimization gap in the subject field. Given the research time limit, the focus will only focus on the kitting process in the Supermarket Storage and no optimization could change the storage’s layout. This resulted in three research question that will be investigated in the thesis.

- Which common approaches exist when it comes to optimizing a kitting process?
- What is the result of each optimizing method in the time aspect?
- When should an optimization method be used, compared to the other methods that will be tested in this research?

In order to solve these questions, was needfinding used to identify the kitting process current problems and the needs of the employees. With this, three optimization methods were identified and selected to be used to optimize the kitting process; optimization of routing, optimization of family grouping and optimization of an electronic system. The optimization of routing focused on the route that the kitter travel and the optimization of the family grouping focused on the article distribution in the Supermarket Storage there each kitting operation’s articles should be stored in the same zone. Finally, the optimization of the electronic system, investigated the possibility to utilize a pick to scan system with the kitting process.
Each optimization was implemented in different field experiment in order to identify how each optimization affected the kitting process. This resulted in that each optimization has improved the kitting process time efficiency and the electronic system had the biggest impact. Some other results were also observed during the experiments. The route optimization improved the learning curve of the kitting process and the family grouping optimization decreased the bottlenecks in kitting process. The electronic system optimization also implemented new benefits that resulted in a profit 2.5 times the cost of the system. Some of the benefits include removal of unneeded processes, quality control of the kitting process and statistics gathering that can be used to improve the process in the future.

These results imply that all three optimization methods can be used in order to improve the time efficiency of a kitting process in a similar storage layout. The routing optimization should be used in a kitting operation with a high rotation of new kitters. The family grouping should be used in a kitting process with bottlenecks in the process and low organization of the article distribution. Ultimately, the electronic system optimization should be used in a kitting process that has unneeded processes and has the need of new tools that the electronic system can implement.
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