

SUMMARY

The goals of this thesis were to propose and carry out a plan for the product implementation, develop and build a production line for the product, and evaluation of the product implementation project.

In this thesis the following tasks were completed:

1. Initial data analysis and project planning

Based on analysis of the product itself as well as the broader business environment, requirements for the manufacturing of the chosen product were worded as a basis for the success of the implementation work. Firstly the general requirements of the product itself were drawn up, relating to the functions the product needs to have, as well as the cost of production. Some of these requirements were then translated to requirements for the production set up, such as the test and traceability scope. Other part of the requirements that were generated were requirements stemming from the needs of the factory and the supporting processes, such as the factory layout requirements and requirements for quality- and environmental management. In the second part of this task a general scope for the assembly operations were presented, based on which a budget estimate could be generated.

2. Implementation of the product into production

This part started with presenting a project implementation time plan based on the scope of work to be done during the project, this plan governed the rest of the activities. An early design and manufactability analysis was carried out, resulting in finding and proposing countermeasures for a dozen issues. Also in this part a production line was designed, starting off with generating a production flow concept, moving on to defining the workstations, finding the need for operators based on volume demands and productivity. The production flow was sequenced and split into workstations, analysing the efficiency of the process and proposing improvements. A process for the traceability of the production process was set up.

During this task the need for equipment was analysed, based on which a number of test stations, fixtures and assembly aids were designed. In addition to that equipment to be bought were selected. Based on the selections and designs made in the previous tasks a production layout design that utilizes LEAN manufacturing principles such as minimal movement and space usage was proposed, the location of the assembly line within the factory was chosen. As a result of this most of the equipment could be manufactured and

bought and an initial production line set up. The set up of the production line was one of the goals of this thesis so that can be considered as fulfilled.

3. Techno-economic analysis of the product implementation project

As a part of this task the project timeline fulfillment was analysed, finding that the project timeline could not be followed as intended as delays from the ODM, as well as the global material shortage delayed the completion of some major milestones on time. An adjusted timeline was described with a proper production test series being skipped due to timeline constraints. While it was planned for the project to conclude by the time of submitting this thesis, this has now been pushed to the future, however these delays weren't in the control of the author and a considerable amount of the total work is already completed.

As a part of this task the production line budget set in the first task was analysed for actual spending, as well as projections for the end results made, and it was found that the actual spending for equipment was able to be reduced considerably, with projections of equipment costs for the project being only nearly half of the budgeted. The manpower costs were found to be projected as exceeding the set amount by approximately 11,3% due to additional work related to the delays. Considering both the hardware and manpower the total forecast for the spending was found be 67.8% of the budgeted, so overall it can be said that financially this work was a success.

In the last section of this task the total cost for manufacturing this product was calculated and compared against the set target. It was found that the cost for the product would be about 7,3% higher than targeted, mainly attributeable to the material cost increase of 10%. This was partially offset by the reduced cost on depreciation of equipment. Overall, even though the price was higher, this increase was mainly due to macro-economical factors out of control for the author, while thanks to work carried out in this task the cost could be reduced, therefore this could still be considered as a success.

In conclusion, the author considers this thesis a success since the goals set for the thesis were accomplished, even though the thesis couldn't cover the whole implementation from start to finish. The work on the project will continue afterwards, with a planned public launch of the product in the coming months.