

## DIPLOMA THESIS EVALUATION

Student's name and surname: Ramalingam Ramesh Lakshmanraj  
 Name of the diploma thesis: Process optimisation by proper selection of batch sizes.  
 Supervisor of the thesis: Ing. František Koblasa, Ph.D.

### 1. Diploma thesis evaluation

Evaluation	excellent	excellent minus	very good	very good minus	good	failed
Meeting the goal and fulfilling task of the thesis	X					
Quality of conducted survey	X					
Methodology of solutions	X					
Expert level of the thesis	X					
Merit of the thesis and its potential applicability of results			X			
Formal and graphic level of the thesis			X			
Student's personal approach	X					

Mark x in the corresponding box.

Supervisor's final evaluation is based on his/her overall subjective evaluation.

Grading is stated literally in the article no. 5, neither by a number, nor by a letter.

### 2. Comments and remarks on diploma thesis:

Thesis is focusing on the problem of selecting manufacturing batch size in KAMAX company. The first part includes a detailed literature review focused on known models of calculating optimal batch sizes, product portfolio and process analyses.

The practical part then reflects the needs of the company and the selection of products representatives. Production processes and manufacturing system is described in detail, including planning horizons and delivery frequencies. Next, an analysis of the current batch sizing policy is made to set a mathematical model and to verify future suggestions.

Five models – minimal batch size, periodic delivery, JIT, economic model and production model are introduced. Those models include various expenses beginning from the production (processing, setup) ending with logistics one. However, those 5 models are hard to connect with those mentioned in the theoretical part. Page 76 includes a general description; however, reference to used equations presented in chapters 2.8.1.-2.8.4 are missing.

Moreover, it is not clear how it is possible that batch sizes (table 18) in the case of the capacity equation model are the same in the case of  $\alpha=0.025$ , 0.5 and 0.15.

Further It is not explained why only the production (with 3 setups of holding cost) and JIT model are used.



Current batch setup, 3 settings of the production model and one JIT model are analytically verified. All models are also simulated in witness simulation software to check if utilization of machines is not exceeding current capacity availability and if customer demand is met. Production model reflecting potential use of storing space for production (ei holding cost reflect cost of production area) is then recommended.

The thesis is well structured; however, naming chapters without explaining what “current production system approach” (ie holding cost given by the company) and “Increased productivity” means can be very confusing for someone not familiar with the motivation of model and coefficient selection.

The same problem is with insufficient naming of tables as Table 18 description does not include specifically part 1 for which is optimal batch calculated and as the table is not referenced in the text. This can be found on the side of the table, which can be overlooked.

Student worked hard during the whole period and showed remarkable will to finish the thesis even in difficult times. Problem with structure and sometimes not very clear descriptions are caused by the extensive size of the thesis. However, the thesis would be at least double size if all steps, which can be seen in the electronic appendix will be explained.

**I recommend the thesis for defence.**

**3. Questions about diploma thesis:**

- 1/ Explain how batches are set in Capacity eq, Periodic, JIT, EPQ and Production model at table 18.
- 2/ Explain why 5.2 chapter is called “current” and 5.3 “increased productivity” and what the “sophisticated facility/inventory” option means.
- 3/ Explain why only JIT and Production model are presented in further analysis.
- 4/ Show appendix in which you are calculating optimal batch sizes and costs.
- 5/ Optimal sizes are set and compared with nowadays values and verified, however in the main body of the thesis, criteria (total expenses) on which base the whole problem is optimized is not shown. Therefore, please compare expenses between the current and optimized solution using a selected model.

**4. Supervisor’s statement on results of the inspection carried out by the anti-plagiarism program in the STAG system:**

Only match given by plagiarism system is less than <5% and is correctly referenced in thesis.

**5. Supervisor’s grading of the diploma thesis:**

Excelent

Date: ....., in Liberec

.....  
*Supervisor’s signature*

