

I. IDENTIFICATION DATA

Thesis name:	Optimizing of the Sequential Line
Author's name:	Yuvaprabhu MANOHARAN
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Process Engineering
Thesis reviewer:	assoc. prof. Ing. Radek Šulc, Ph.D.
Reviewer's department:	Department of Process Engineering

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	ordinarily challenging
<i>Evaluation of thesis difficulty of assignment.</i>	
The main objective of this thesis is optimizing of the sequential line for electrocoating. The following goals were declared in master thesis assignment: 1) to identify bottlenecks, 2) to propose line modification for increase of production capacity, and 3) to minimize consumption of chemicals and energy and waste production. This assignment comprehensively covers the activities carried out by engineering companies.	

Satisfaction of assignment	fulfilled
<i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i>	
The all task were discussed in individual chapters and subchapters in detail. The thesis meets the assignment.	

Method of conception	correct
<i>Assess that student has chosen correct approach or solution methods.</i>	
The author has chosen appropriate approach to solving of formulated tasks.	

Technical level	C - good.
<i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i>	
Some data that were used as input data were overtaken without any comment or explanation. Commentary in detail: Figures 1 and 6: the difference between continuous and sequencing line for electrocoating is not clear for me from Figures 1 and 6. Page 20 Table 1: "process kg.cm ² ": name of property is missing; "PTS" – the explanation of abbreviation is missing. Page 22 Table 2: the prices are questionable. Only 2000 EUR for baking oven is sufficient? Page 31 Capture techniques: adsorption and biofiltering are not able to return vapors to the liquid state. Page 35 Table 7: the capacity of production line for which the costs are presented is not specified (133 440 m ² /year or different ?) Page 41: design of coating line: the design capacity is not presented. Page 45: volume of tanks, power consumption: the procedure for determining of these values is not described. Page 46: cooling: air flow, power input: the procedure for determining of these values is not described. Page 56 Maintenance cost per unit: division by zero. Page 59 Relations for amount of storage, number of packages and total stock o chemicals: unclear and confusing. Page 60 Table 14: difference between "consumption of energy per year" and "consumption of energy"; comparable values 396 kWh vs. 102 kWh. Page 62 Table 15 – weight (week): the procedure for determining of this value is not described.	

Formal and language level, scope of thesis	D - satisfactory.
<i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i>	
Page 22: "elector coating plant" ????	

The SI Units should be used (e.g. Table 6 unit of kg/cm² for pressure).
The equations are not numbered.
The figures 8 and 9 are the same.
Page 60 Table 14: healing system ???
Page 64 text vs. Table 16: VOC emission 160.3 g/year vs. 160.3 g/h respectively, and VOC in Kiln: 112.2 g/year vs. 112.2 g/h respectively.
Page 70 - 7. Subscripts: the more corresponding heading is "Abbreviation". The abbreviations should be presented in alphabetical order.
Section "Symbols" is missing. The presence of this section could clarify a number of uncertainties.

Selection of sources, citation correctness

C - good.

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The selection of sources is satisfactory. Used elements are correctly distinguished from own results and thoughts.

In some cases the source of cited data is missing:

* Figs. 1-5 – source is missing.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

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III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Summarize thesis aspects that swayed your final evaluation. Please present apt questions which student should answer during defense.

I would like to discuss following topics during defense discussion:

- 1) Please, explain the differences between continuous and sequencing line for electrocoating.
- 2) Please, present the scheme of original and improved process of waste water treatment
- 3) How were the values of tank volumes and power consumption determined (chapter 4.2)?
- 4) Page 60 Table 14 take off factor: how was this value determined?
- 5) Page 62 Waste water: time period for bath renewal: how was this value determined?

The thesis submitted fulfils the requirements for the master thesis. The goals declared were satisfied. I recommend the master thesis submitted by Mr. Yuvaprabhu Manoharan to the defense. Owing to the level of technical and formal quality I evaluate handed thesis with classification grade **C - good**.

Date: **25.8.2017**

Signature: assoc. prof. Ing. Radek Šulc, Ph.D.