SUPERVISOR´S EVALUTION
OF DIPLOMA THESIS

I. IDENTIFICATION DATA

Title:	**Environmental-friendly technology for cellulosic fibre extraction for biorefinery**
Author:	**Bc. Salman Azizov**
Type of thesis:	Master
Faculty/department:	Faculty of Mechanical Engineering
Department:	Department of Process Engineering
Supervisor:	assoc. prof. Ing. Lukáš Krátký, Ph.D.
Supervisor´s place of employment:	FME CTU in Prague, Department of Process Engineering

II. EVALUATION CRITERIONS

Diploma thesis assignment	**Average**

Difficulty evaluation of the diploma thesis assignment.

The main aim of thesis was to design PFD and PID charts for environmental friendly technology for cellulosic fibre extraction for biorefinery including economical study of investment and productions costs, and payback. This topic was therefore a typical job for mechanical engineering, so its difficulty was average.

Fulfilment of thesis´s assignment	**Fulfilled**

Evaluate, whether the proposed final work fulfils the assignment. Comment where appropriate, points of reference that were not fully met, or if the work is extended compared to assignment. If the assignment is also not completely fulfilled, try to assess the importance, impact and possibly cause various deficiencies.

The main tasks of this thesis were to design technology for cellulosic fibre extraction including PFID flowsheet, mass and energy balances, investment and operational costs, and payback. All this problematic was discussed in individual chapters and subchapters in detail. The tasks of thesis were therefore fulfilled.

Activity and independence during thesis´s processing	**B–very good**

Evaluate whether the student was active during thesis´s processing, whether he respected specific deadlines, if his solution was continuously consulted and whether he was sufficiently prepared for consultations. Consider the student's ability to work independently and creatively.

The author´s approach was enormously active. He was always ready for consultations and he successfully fulfils all tasks given by supervisor for next meetings. Nevertheless, a support of supervisor was needed during consultations like stronger support in mass and energy balancing than normally needed.

Professional level	**B–very good**

Assess the expertise level of thesis, using knowledge gained from the study of scientific literature, documentation and utilization of data obtained from practice.

The professional level of the text itself and all the performed process calculations have standard level. There are some errors in mass balancing streams, input is not equal to output in PFD diagram´s table. Energy balance could be evaluated more in detail. PID has standard basic level.

Formal and language level	**A–Excellent**

Assess formal correctness in the bibliography, the typographical and linguistic aspects of thesis.

Thesis contains all the necessary formal requirements.

Bibliography	**A–Excellent**
Comment the student's activity during the acquisition and use of learning materials to solve thesis. Characterize the selection of sources. Assess whether the student made use of all relevant sources. Verify that adopted information is properly distinguished from student´s results and considerations, whether citation forms are correspond with ethics, whether bibliographic citations are complete and finally whether all citation are in accordance with the practices and standards.	
Author used relevant 39 references in the text. Citations in the manuscript and their format listed in the bibliography are in accordance with the European Copyright Act No. 121/2000 and even with all the citation practices.	

Other comments
Comment the level achieved major results of the final work, e.g. the level of theoretical results, or the functional level of technical solutions, publication outlets, experimental skills, etc.
No comments

III. FINAL EVALUATION AND PROPOSAL OF CLASSIFICATION

Summarize aspects of the thesis that most influenced your final evaluation.

Master thesis of Mr. Azizov was scoped to genuinely new technology of waste usage to produce valuable materials. He firstly evaluated a potential of lignocellulosic waste to be a raw material for cellulosic fibre production. He reviewed its potential, suitable materials and technological set up to produce cellulosic fibre. Based on his own proposal, block diagram of technology was proposed and defined by PFD and PID charts. His technological set-up is at high level, environmental friendly cellulosic fibre extraction technology where extraction waste water is used to produce biogas that is combusted in CHP to preheat air for cellulosic fibre drying. He prepared excel file with mass and energy balances, and economical analysis of such a technology with investment, operational costs and payback included.

Mr. Salman Azizov was proved by such a thesis that he has skills of mechanical engineer. The results of master thesis are very interesting for future visions in lignocellulosic waste conversion technologies. Such a techno-economical analyse is missing in global point of view. Nevertheless, there are some minor errors in PFD mass balances and energy balance is not done in detail.

Based on its quality and student´s level during preparation of the thesis, me undersigned Lukas Kratky, I evaluate it as the supervisor by the grade **B – very good**.

Date: 21.8.2017   Signature: assoc. prof. Ing. Lukáš Krátký, Ph.D.