

## I. IDENTIFICATION DATA

<b>Title:</b>	<b>DRYING OF BIOMASS WITH HIGH WATER CONTENT</b>
<b>Author:</b>	<b>Bc. Pavel Kovařík</b>
<b>Type of thesis:</b>	<b>MASTER'S THESIS</b>
<b>Faculty/department:</b>	Faculty of Mechanical Engineering
<b>Department:</b>	Department of Energy Engineering
<b>Reviewer:</b>	Ing. Jan Opatřil, Ph.D.
<b>Reviewer's place of employment:</b>	ÚJV Řež, a.s.

## II. EVALUATION CRITERIONS

<b>Diploma thesis assignment</b> <i>Difficulty evaluation of the diploma thesis assignment.</i> The assignment meets requirements for master's thesis.	<b>Medium Challenging</b>
<b>Fulfilment of thesis's assignment</b> <i>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.</i> The thesis meets all tasks of assignment.	<b>Fulfilled</b>
<b>Activity and independence during thesis's processing</b> <i>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.</i> Reviewer is not able to evaluate student's activity and independence.	<b>-</b>
<b>Professional level</b> <i>Assess the expertise level of thesis, using knowledge gained from the study of scientific literature, documentation and utilization of data obtained from practice.</i> Student proved ability to solve engineering problems.	<b>B – Very good</b>
<b>Formal and language level</b> <i>Assess formal correctness in the bibliography, the typographical and linguistic aspects of thesis.</i> Unclear descriptions occur in the text.	<b>D – Satisfactory</b>
<b>Bibliography</b> <i>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.</i> Selected sources meet requirements on master thesis. Some of referenced literature does not contain presented information. Citations are not sorted.	<b>C – Good</b>
<b>Other comments</b> <i>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.</i> The approach of solution of the issue is chose correctly.	



### III. FINAL EVALUATION AND PROPOSAL OF CLASSIFICATION

The thesis could be divided into two basic parts. The first one includes chapters from 1 to 4, which are mainly based on literature search procedure and describes biomass for energy purposes, its characteristic properties, drying process as well as types of dryers. This part is poorly processed and could be done in better way, because for the biomass topic considerable amount of literature is available. Some of descriptions are not coherent and sometimes chaotic as well as unclear.

The second part (chapters from 5 to 8) includes experimental work and its evaluation, design of rotary drum dryer, detailed calculations of stoichiometry and boiler efficiency, impact of dryer integration into small heating plant with nominal power output of 1 MWt and also its economical evaluation. For me this is the key part of thesis and it is well treated.

The master thesis formatting should be treated more carefully. Namely, the incorrect formatting includes non-uniform tables, figures with Czech descriptions (e.g. Figure 3.1), missing references to tables and figures in text. Some citations are wrong, respectively the source doesn't content presented data or information (e.g. Table 2.1).

It is a pity that overall impression of the work is decreased by introductory chapters. On the other side in this master thesis it is necessary to point out experimental work and detailed calculation of impacts of dryer integration. Here occurs only one unclear fact and it is risk analysis of investment based on operational hours. The values of payback period for operation 4000 and 6000 hours per year seems to be incorrect (see table 7.7).

The submitted thesis fulfils master degree requirements and deserves overall grade C – good.

Please explain following questions:

1. Why the experiment number 4 reached the highest energy consumption?
2. Why was amount of water in input material lower then then evaporated amount of water in case of the experiment number 4?
3. In the chapter 4.1 Drum steam dryer is claimed that overheated steam is used as heating source, but in same section is also mentioned saturated steam at pressure range from 0,6 to 1 MPa. Which statement is correct? What parameters (temperature, pressure) of steam would you recommend for reaching ideal operation of rotary drum dryers?
4. Please correct values of payback period in case of different operating hours.

Date: 3.2.2017

Signature:

