



**MECHANICAL ENGINEERING STUDY PROGRAM  
FACULTY OF MECHANICAL AND AEROSPACE ENGINEERING  
BANDUNG INSTITUTE OF TECHNOLOGY**

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**Review of the Master Thesis CTU-ITB**

**Reviewer:**

Dr Ir Prihadi Setyo Darmanto  
Associate Professor at Faculty of Mechanical and Aerospace Engineering  
Bandung Institute of Technology, Bandung, Indonesia

**Title of the Thesis:**

*DRYING OF BIOMASS WITH HIGH WATER CONTENT*

**Prepared by:**

Pavel Kovarik, Master Student of Czech Technical University and Bandung Institute of Technology.

**Introduction:**

Before I have taken the responsibility as a co-supervisor of the work and thesis of Mr. Pavel Kovarik, I know him as my student since he was attending my class on Air Conditioning System. Therefore, I know him as a good, curious, motivated and hard working student and finally I have given to him an excellent mark.

During his thesis work and writing the report, we have conducted an intense communication and discussion by e-mail, where we have exchange ideas and learning together on this very interesting topic on drying process of biomass (wood chips) as the boiler fuel pre-treatment.

**Review:**

The main topic of this master thesis is concerning the experimental of wood chips drying process, design of steam dryer for drying wood chips and economic study comparison of boiler operation using raw and dried wood chips as fuel. The experimental study on wood chips drying process is very useful on gathering the information concerning the drying curve characteristic that will be required during the design process of steam drum dryer. Based on the results of this experimental work, complete design of the main dimension and parameters (square and volumetric evaporation capacities) of steam drum dryer was also conducted and reported in this thesis. This steam drum dryer is used for drying wood chips from 60% to 20% of moisture content (MC) which will be prepared as main pre-treated fuel of 1 MW boiler. In order to make sure that the boiler operation using pre-treated wood chips is more efficient and economically feasible, financial study on the comparison of boiler operation using raw (60% MC) and dried (20% MC) wood chips was also reported in this thesis work. The results show that the used of dried fuel is beneficial. However the benefit depends on the price of raw and dried wood chips as well as the investment cost of the dryer.

Overall of the study, the research questions on the economic advantage of high water content biomass drying as the pre-treatment process of boiler main fuel can be answered systematically by the results of study.

**Conclusion:**

As the conclusion, as the supervisor of the thesis, it is reasonable to say that this thesis work is an excellent research work and report.

**Mark:** Excellent

**Bandung, 8 February 2017**

**Signature of the reviewer**

*Prihadi Setyo Darmanto*