

## I. IDENTIFICATION DATA

<b>Thesis title:</b>	Hydrogen production, storage and distribution for a powertrain test laboratory
<b>Author's name:</b>	Senghani Abhishek Vijay
<b>Type of thesis :</b>	master
<b>Faculty/Institute:</b>	Faculty of Mechanical Engineering (FME)
<b>Department:</b>	Department of Automotive, Combustion Engine and Railway Engineering
<b>Thesis supervisor:</b>	Ing. Jiří Vávra, Ph.D.
<b>Reviewer's department:</b>	Ú12120

## II. EVALUATION OF INDIVIDUAL CRITERIA

<b>Assignment</b>	<b>challenging</b>
<i>How demanding was the assigned project?</i>	
Increasing demand for hydrogen supply of the vehicle powertrain testing lab at the Faculty of Mechanical Engineering and our research center calls for exploration of various feasible ways of in-house production of hydrogen. This was the main motivation for this quite non-traditional thesis assignment.	

<b>Fulfilment of assignment</b>	<b>fulfilled</b>
<i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	
All important tasks have been successfully completed in this thesis.	

<b>Activity and independence when creating final thesis</b>	<b>A - excellent.</b>
<i>Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.</i>	
The student contributed and presented his findings regularly. I would like to point out the way of regular presentations of his findings. He also searched for and learned various available engineering tools for the analysis of hydrogen production beyond the scope of his study program. The student came with his own ideas to solve the wide topic. Despite the distant way of communication the student was always well prepared for consultations with the supervisor.	

<b>Technical level</b>	<b>A - excellent.</b>
<i>Is the thesis technically sound? How well did the student employ expertise in his/her field of study? Does the student explain clearly what he/she has done?</i>	
Most of the findings seem reasonable. The technical detail in modeling approach is appropriate.	

<b>Formal level and language level, scope of thesis</b>	<b>B - very good.</b>
<i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	
The language is clear and concise, maybe too much. Although the supervisor is well acquainted with the work, it is difficult to find the way around the Thesis report. A graphical presentation is unbalanced. The thesis would deserve more care for the graphical presentation. The supervisor has not seen yet the printed version of the diploma work. But it seems, it would be very difficult to see all of the graphics, that apparently exceed the printer margins.	

<b>Selection of sources, citation correctness</b>	<b>B - very good.</b>
<i>Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?</i>	
Literature search is appropriate. However, the list of references is too brief and citations would need more care.	

One funny example: A reference [12] says: "H. S. T. Y. H. T. H. H. T. T. H. T. T. K. T. N. K. Nobuhiko Takeichi, "Hybrid hydrogen storage vessel", a novel high-pressure hydrogen storage vessel combined with hydrogen storage material," *Hydrogen Energy*, vol. 28, p. 9, 2002."

The correct way might look like this: „Nobuhiko Takeichi, Hiroshi Senoh, Tomoyuki Yokota, Hidekazu Tsuruta, Kenjiro Hamada, Hiroyuki T. Takeshita, Hideaki Tanaka, Tetsu Kiyobayashi, Toshio Takano, Nobuhiro Kuriyama, "Hybrid hydrogen storage vessel", a novel high-pressure hydrogen storage vessel combined with hydrogen storage material, *International Journal of Hydrogen Energy*, Volume 28, Issue 10, 2003, Pages 1121-1129, ISSN 0360-3199, [https://doi.org/10.1016/S0360-3199\(02\)00216-1](https://doi.org/10.1016/S0360-3199(02)00216-1)."

### **Additional commentary and evaluation (optional)**

*Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.*

The cooperation with Mr. Senghani started in February 2020 and with some breaks during summer vacations and fall lasted till December 2020. In addition to the technical assignment the student tried to evaluate an economic aspects of various method for hydrogen production and storage. He also inquired many electrolyser and compressor suppliers and received valuable price estimates. This is gratifying and it is not very typical approach for the students of the technical study program.

### **III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE**

*The work compares and summarizes available ways of in-house production and storage for hydrogen supply of the university vehicle testing laboratory. The work can be viewed as an introductory insight into this subject and a great base for future works and decisions for the suitable ways of the hydrogen supply of the testing laboratory.*

The grade that I award for the thesis is **A - excellent**.

Date: **2.2.2021**

Signature:

