THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Design of 12V and 400V Lithium-Ion Battery Pack for an Electric Vehicle with Immersive Cooling**
Author's name:	**Kanishka Mathur**
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Automotive, Combustion Engine and Railway Engineering.
Thesis reviewer:	Ing. Josef Morkus, CSc.
Reviewer's department:	Centre of Vehicles for Sustainable Mobility

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment **challenging**

How demanding was the assigned project?

The work contains a complex design of two batteries with different voltages for an electric car

Fulfilment of assignment **fulfilled**

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.

The task was processed for a specific client. However, the official assignment is not included in the work. From the text it can be concluded that the assignment was fulfilled.

Methodology **correct**

Comment on the correctness of the approach and/or the solution methods.

The work logically begins with a general description of the requirements for li-ion batteries, including cooling and battery management system. In the following chapters there is a detailed design of 12V and 400V batteries and in annexes there is a description of the production process of battery parts.

Technical level **A - excellent.**

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

The work is at a high professional level. I appreciate the very well-crafted overview in Chapter 2 as well as the detailed design of the batteries, including the cooling system, accessories and assembly. The text is supplemented by a number of tables with specific values.
A small note: in equation 20, the rolling resistance is missing.

Formal and language level, scope of thesis **B - very good.**

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?

The scope of work of approximately 100 pages plus appendices is quite satisfactory. The text is written clearly with a small number of mistakes and typing errors. Page numbering is missing. Some pictures are incorrectly numbered.

Selection of sources, citation correctness **C - good.**

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?

There are 34 literary sources in the work, but the references are only sporadically in the text. These are especially missing at equations and tables, which makes it very difficult to identify what is the author's own work and what is taken from the literature.

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.
Please insert your comments here.

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

I especially appreciate the technical level of the work. Despite some formal reservations, I propose the final evaluation

A - excellent.

I have one question: Why is a nickel plate used when it has a significantly higher resistance, why not aluminum, for example?

Date: **1.9.2021** Signature: Josef Morkus