# SUPERVISOR´S ASSESSMENT ON DIPLOMA THESIS

**Student´s name and surname:** Bc. Chyva Hout

**Name of the diploma thesis:** Innovation and design of the battery box for electric vehicles

**Supervisor of the thesis:** doc. Ing. Michal Petrů, Ph.D.

**1. Diploma thesis evaluation**

| Evaluation | excellent | excellent minus | very good | very good minus | good | failed |
|---|---|---|---|---|---|---|
| **Meeting the goal and fulfilling task of the thesis** | *x* | | | | | |
| **Quality of conducted survey** | | *x* | | | | |
| **Methodology of solutions** | | *x* | | | | |
| **Expert level of the thesis** | *x* | | | | | |
| **Merit of the thesis and its potential applicability of results** | *x* | | | | | |
| **Formal and graphic level of the thesis** | *x* | | | | | |

*Mark **x** in the corresponding box.*
*Supervisor´s final evaluation is based on his/her overall subjective evaluation.*
*Grading is stated literally in the article no. 5, neither by a number, nor by a letter.*

## 2. Comments and remarks on diploma thesis:

Submitted diploma thesis (DP) Mr. Bc. Hout Chyva was prepared in accordance with the second part, article 14 of the Study and Examination Regulations of the Technical University of Liberec, Faculty of Mechanical Engineering. The thesis deals with a topic related to the field of study. It consists of a text part and an appendix. The thesis contains a total of 80 pages, 58 figures, 17 tables and 8 appendices. The result of the diploma thesis is the innovation and design of the battery box for electric vehicles, including the 3D model of the assembly and the drawing documentation of the assembly and some parts.

- **Overall and comments to diploma thesis**

In the introduction author presents main objectives of the MSc. thesis, where he states that goal of this MSc. thesis is to explore innovative design strategies for the new battery box in electric vehicles. Author described that primary focus will be on achieving lightweight design by exploring materials to develop a light battery box, aiming to optimize the overall weight without compromising structural integrity or safety. Therefore in the following chapters, the author conducts an in-depth investigation into the current status of battery boxes for electric vehicles to explore the existing designs, materials in use, problem areas, and manufacturing processes (Chapter 2)). He is using also patent search for study new battery boxes and new solutions about topic (Chapter 3). He is found several patents that state that new directions for battery boxes are also composite structures. In Chapter 4 author described new design of concepts for battery box (5 concepts) and performed the final concept selection. He was used method of AHP (Analytic Hierarchy Process) where selecting

criteria - A - Lightweight, B - Electrical insulation, C - Safety, D - Cost, E - Modular designs. Results of AHP is show in table 17, where the best score close to Concept 2. In Chapter 6 the author has made the design of battery box from composite material (eg. 42, 67 p.). This construction was calculating for analysis of temperature inside the battery box by FEM (Fig. 47, 70 p. or eg. Fig. 56 the temperature field inside the battery box) also. The simulation outcomes reveal that the internal temperature of the battery enclosure ranges from a maximum of 54 degrees Celsius (°C) to a minimum of 4.5506 degrees Celsius (°C) under the specified boundary condition. In final chapter he did overall results and comments that This Master's Thesis dealt with the innovation and design of the new battery box for electric vehicles.

By the comments and notes about of the presented solution for innovation and design of the battery box for electric vehicles, including the developed technical documentation, it can be stated that all the objectives of the MSc. thesis have been met.

**Notes on the work:** The author used on recommended literature and other sources, the work is well and logically organized, the chapters are connected to each other and the work is related to the field of study. There are some minor flaws in the wording, some typos in the work, which, however, do not reduce the final evaluation of the work. The technical documentation is at a very good level.

The MSc. thesis meets the requirements for the award of the title "Ing." after a successful defense.

**3. Questions about diploma thesis:**
None.

**4. Statement of the supervisor of the thesis on the result of the check carried out by the anti-plagiarism program in the STAG system**
A thesis is not plagiarism. This is an original work.

**5. Supervisor´s grading: EXCELLENT**

Date 19.01.2024, in Liberec

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*Supervisor's signature*