

## OPPONENT'S ASSESSMENT ON DIPLOMA THESIS

**Student's name and surname:** Mohammad Yousef Hdaib

**Name of the diploma thesis:** Experimental study of foaming agents in water and their application in the metal foaming

**Supervisor of the thesis:** prof. Ing. Karel Fraňa, Ph.D.

**Opponent:** doc. Ing. Jiří Machuta, 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	
Student's personal approach			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:

The submitted diploma thesis is processed on 61 pages of text and is divided into 5 main chapters. This thesis solves a very interesting and problematic issue that has a great potential today, especially in the automotive industry, such as the production of lightweight aluminum structures – aluminium foams. Main aim of this thesis is to provide an illustration on foaming phenomena in water alcoholic-mixtures, and an investigation of its application in foaming process in molten metal. This work could determine the direction in which will be conducted the research of these materials and technologies of their production. In the experimental part student performed an interesting experiment in image analysis. The results of the experiment have the potential to be used for further research in the field of aluminum foams. The student fulfilled the assignment but didn't fully use the potential of this topic. The formal structure of the work is unclear. The natural continuity of individual chapters is missing. Despite these shortcomings, the student demonstrated in this work the ability to implement and evaluate the prepared experiment. I didn't find incorrect judgments in the conclusions, but again, the presentation of partial results and conclusions is confusing for the reader.

### 3. Questions about diploma thesis:

What is the potential of aluminium foams in modern industrial production?

Please summarize the most important points resp. necessary recommendations for the production of quality aluminum foam based on the results of your experiments.

**4. Opponent's statement whether the diploma thesis meets the academic title requirements and whether it is recommended for defense:**

The submitted diploma thesis meets the requirements for the award of an academic degree and I recommend this work for defense.

**5. Opponent's grading:**

I evaluate the submitted diploma thesis with the mark "Very good".

Date 15.6.2020, in Liberec

doc. Ing. Jiří Machuta, Ph.D.

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*Opponent's signature*