

OPPONENT'S ASSESSMENT ON DIPLOMA THESIS

Student's name and surname: Feben Tereffe Huluka

Name of the diploma thesis: Application of nano-layers for the improvement of the cavitation resistance

Supervisor of the thesis: Ing. Miloš Müller, Ph.D.

Opponent: *Dipl.-Ing. Edmund Ofei Aidoo*

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:

Meeting the goal and fulfilling task of the thesis

The diploma thesis "Application of nano-layers for the improvement of the cavitation resistance" submitted by Miss Feben Tereffe Huluka fulfils all requirements.

Quality of conducted survey

The author conducted an extensive and compressive literature citing 69 sources relating to types and effects of cavitation, dynamics of cavitation bubbles and the resulting material response to cavitation bubble impact. Regarding the topic of cavitation erosion, the student focused on Aluminum and its alloys and described many parameters which may affect the resistance of coated materials to cavitation.

Methodology of solutions

Based on a thorough literature review, the author carried out an elaborate sample preparation described in Chapter 3 and conducted cavitation test on the sample to ascertain the impact of the coatings on the cavitation resistance.



Expert level of the thesis

The amount of data obtained from the experiment is considerably good and useful for cavitation resistance assessment. The author used Microscopy in describing morphological changes on the surface of the test samples and went on to describe other mechanical changes that occur as a result of the pretreatment approach.

Merit of the thesis and its potential applicability of results

The authors' work is useful for a variety of applications and based on the results, appropriate coating technique can be employed in areas where specific requirements based on material quality is needed such as in the area of biomedical applications.

Formal and graphic level of the thesis

Graphical illustrations of the main results offer a comparative analysis of the effect of the pretreatment methods and the other parameters that may impact the cavitation resistance of the material. While the level of English used is excellent there are a considerable number of formal errors in some of the texts which can be improved.

Student's personal approach

Gathering data for mass loss tests is demanding therefore the author should be lauded for the tremendous effort shown in data acquisition, processing and presentation.

3. Questions about diploma thesis:

- a. **How does the deposition time impact the resistance of the material to cavitation?**
- b. **How will you describe the relationship between the deposition time of the coatings and the incubation period of the material under cavitation?**
- c. **What steps will you recommend to reduce the erosion rate of the coated surfaces?**

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

The authors' problem-solving approach as an engineer is evident in designing an experiment and conducting an extensive analysis of the results. The student concluded by identifying the dependence of the coating method and the influence of the substrate's mechanical as key parameters in improving the resistance of the material to cavitation erosion. On this account, I conclude that the Diploma thesis meets the academic title requirement and recommend it for defense.

5. Opponent's grading: Excellent

Date 17. 06. 2020, in Prague



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Opponent's signature

