

Author of the thesis: Edmund Ofei Aidoo

Title of the thesis: Material Response on the Cavitation Bubble Collapses

Type of the thesis: Diploma thesis

Supervisor: Ing. Miloš Müller, Ph.D.

Institution of the supervisor: Technical University of Liberec

A. Formal essentials of the thesis: Excellent

(Rate linguistic and typographical level of work, text structure, sorting chapters, illustrations, correctness and completeness of citations literary sources)

The thesis is written in good, technical English, without mistakes. The chapters of the diploma thesis are well arranged and the text clearly describes the solved problem, pictures and charts. The illustrations are precisely drawn and included in good quality. The citations and literary sources are relevant to the thesis subject and are included in complete and retrievable form.

B. Thesis theoretical part: Excellent

(Rate the extent and manner of research, a way of describing the problem solved or the suitability and complexity of used theoretical method.)

The theoretical part of the thesis provides good background for the experiment setting and assembly and also for the evaluation of experimental results. The literature review is focused on the interaction between the collapsing bubble and the wall including the material response following the thesis assignment. Principles of the used measurement techniques are also described.

C. Thesis practical part: Excellent

(Rate adequacy and sophistication of the methods used, the level and amount of data obtained.)

Three different durations of the cavitation exposure time were selected. The used approach is adequate to model different cavitation aggressiveness intensities. The used measurements and evaluation methods are suitable for the solved problem. The sample material was selected carefully to obtain sufficient data in reasonable time.



D. Results analysis: Excellent

(Rate the level of processing of data, including the determination of measurement uncertainties, discussion of the results and formulated conclusions.)

The main output of data processing represents the pits distribution at the exposed surface for different cavitation intensity levels. The student used Matlab algorithms to extract the data from the treated samples. The uncertainty analysis is included in corresponding histograms. The advantages and disadvantages of the electron microscopy and laser profilometry are discoursed in detail.

E. Level and quality of the thesis: Excellent

(Rate overall complexity and scope of work and original contribution of the student.)

The supplied thesis is an original and creative work dealing with a very actual topic. The selected topic forced the student to adopt successfully advanced experimental techniques and evaluation methods. I highly appreciate the student's deployment and carefulness during the thesis elaboration.

Overall evaluation:

The supplied diploma thesis is elaborated at an excellent level from the formal, theoretical and experimental points of view. The student proved through the thesis his ability to solve a submitted problem and formulate clearly the results. The experiences collected by the student during this work represent a very good background for any following work in the field of the cavitation erosion testing.

Questions for the defense:

Are there any other possibilities to modify the cavitation field intensity?

Can you estimate the duration of the incubation phase for the used samples?

Qualification:

I suggest this work to classify as "Excellent"

In, Liberec 5th of June, 2018

I certify that I am not in any personal relationship with the author of the work



Supervisor's signature