

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Aleksandr Vedernikov

PhD Program: Mathematics and Mechanics

Title of Thesis: Effects of technological regimes on structural performance of pultruded profiles

Supervisor: Assistant Professor Alexander Safonov

Name of the Reviewer: Dr Wahid Ferdous

I confirm the absence of any conflict of interest

Date: 03-09-2022

The purpose of this report is to obtain an independent review from the members of PhD defense Jury before the thesis defense. The members of PhD defense Jury are asked to submit signed copy of the report at least 30 days prior the thesis defense. The Reviewers are asked to bring a copy of the completed report to the thesis defense and to discuss the contents of each report with each other before the thesis defense.

If the reviewers have any queries about the thesis which they wish to raise in advance, please contact the Chair of the Jury.

Reviewer's Report

Reviewers report should contain the following items:

- Brief evaluation of the thesis quality and overall structure of the dissertation.
- The relevance of the topic of dissertation work to its actual content
- The relevance of the methods used in the dissertation
- The scientific significance of the results obtained and their compliance with the international level and current state of the art
- The relevance of the obtained results to applications (if applicable)
- The quality of publications

The summary of issues to be addressed before/during the thesis defense

This PhD dissertation investigated the effects of technological regimes on pultruded profile structural performance. Pultruded flat laminates and L-shaped structural profiles were investigated experimentally and numerically. There are several aspects of this PhD dissertation that need to be addressed clearly, according to the examiner.

1. All the results and relationships are explained based on the observation of bubbles and voids in the laminates. It is important for the author to explain how other researchers will use the results of this study since their laminates might not contain bubbles and voids as this one does.
2. According to the author, high pulling speeds can increase pultrusion output by at least 1.7 times without compromising the mechanical performance of produced profiles as compared to profiles produced at regular speeds. What is the maximum pulling speed that needs to be mentioned clearly?
3. It is also necessary for the author to explain the negative effects of pulling speed on the samples' quality. How does the higher pulling speed affect the curing of pultruded composites? What is the effect of pulling speed on composite brittleness?
4. In section 1.3.1, the information should be presented as a story rather than as a number of small paragraphs. There is currently a lack of coherence among the paragraphs.
5. Research gaps and novelty of this study should be clearly identified.
6. The scientific contributions should be presented briefly in a separate section in the conclusion. Currently, this is explained in a descriptive manner.
7. A separate section should be devoted to describing how this study will benefit society (practical implementation).
8. Journal articles and conference papers should be listed separately on Page 6, as they are not equally weighted. Procedia Manufacturing, IOP Conference Series, are these journals? It is also important to clearly differentiate between the one that has been published and the one that is currently under review. Some of the articles maintain high standards while others are published in journals outside the top quartile. It is important to focus on quality rather than quantity.

Overall, this is a good piece of work that identifies some key challenges in producing pultruded composites more efficiently.

Provisional Recommendation

☐ *I recommend that the candidate should defend the thesis by means of a formal thesis defense*

☒ *I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report*

☐ *The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense*