Skoltech
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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: Igor Shishkovsky, Associate Prof.

I confirm the absence of any conflict of interest (Alternatively, Reviewer can formulate a possible conflict)	**Date: 29-09-2022**

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:

1. Brief evaluation of the thesis quality and overall structure of the dissertation.

The dissertation is devoted to the optimization of technological regimes of pultruded profiles on performance their manufacturing. Such profiles could be strongly recommended in civil and aerospace engineering over the last decades. The thesis is well-written. The overall structure of the dissertation is clear and easy to follow. The first chapter provides a state of art survey, a second chapter describes a material behavior model with includes heat transfer and mechanical 2D equations. Chapter 3 is discussed in overall the results of numerical and experimental studies. Following 4-11 chapters are described case studies and presented the copies of published and submitted papers. Conclusion section is summarized of main achievements and some future perspectives. The relevance of the topic of dissertation work to its actual content is visible.

2. The relevance of the methods used in the dissertation

All the contents are highly relevant to the topic. The main methods and approaches are clear presented in second and third chapters.

3. The scientific significance of the results obtained and their compliance with the international level and current state of the art

The scientific significance of the results and their international level can be judged by the quantity and quality of scientific articles published by the author.

4. The relevance of the obtained results to applications (if applicable)

The practical significance of the dissertation is obvious. The author with help of case studies shows how and where the results of his research can be used.

5. The quality of publications

The dissertation is based on 12 co-authored publications and three manuscripts are under reviewing. Aleksandr Vedernikov was contributed as the first author into 14 articles. Some papers are published in high level journals, including Journal of Composite Materials, Polymers, Composites Part A: Applied Science and Manufacturing and etc.

The number and level of publications as well as the position of the PhD candidate in the co-author's list apparently show his sufficient contribution to the research field.

On this very positive background, I still have some minor issues:

- I would like to hear the author's comments on the scalability of the numerical models he built. Is there enough studies to build large structures from pultruded profiles (bridges, buildings, etc.)

- The author practically did not study the influence of the environment on the behavior of its materials - humidity, high or low pressure, excess or lack of nitrogen, carbon dioxide, aggressive media (acids, alkalis, arctic conditions), etc.

Therefore, the thesis by Aleksandr Vedernikov is a comprehensive and self-contained study, which should be deserving the PhD degree. No issues to be addressed further.

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*