

## I. IDENTIFICATION DATA

<b>Thesis title:</b>	<b>Numerical Simulation of Flow in the Inlet Chamber of an Automotive Air Conditioning Condenser</b>
<b>Author's name:</b>	<b>Egor Kalmykov</b>
<b>Type of thesis :</b>	bachelor
<b>Faculty/Institute:</b>	Faculty of Mechanical Engineering (FME)
<b>Department:</b>	Department of Fluid Mechanics and Thermodynamics
<b>Thesis reviewer:</b>	doc. Ing. Tomáš Hyhlík, Ph.D.
<b>Reviewer's department:</b>	Department of Fluid Mechanics and Thermodynamics

## II. EVALUATION OF INDIVIDUAL CRITERIA

<b>Assignment</b>	<b>challenging</b>
<i>How demanding was the assigned project?</i>	
The chosen topic is challenging for bachelor's degree students and requires further study of the computational fluid dynamics techniques used.	

<b>Fulfilment of assignment</b>	<b>fulfilled with minor objections</b>
<i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	
Although the author completed all the tasks of the bachelor's thesis, the reviewer has many doubts about the quality of the work.	

<b>Methodology</b>	<b>partially applicable</b>
<i>Comment on the correctness of the approach and/or the solution methods.</i>	
From a general standpoint, the problem-solving approach is correct. However, the reviewer has concerns regarding the appropriateness of the computational mesh and the accuracy of the loss estimations.	

<b>Technical level</b>	<b>D - satisfactory.</b>
<i>Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?</i>	
In my opinion, the loss coefficient is calculated incorrectly. Unfortunately, the author does not offer enough supporting materials for verification. An unsuitable function is used to define the dependency of the loss coefficient on speed.	

<b>Formal and language level, scope of thesis</b>	<b>C - good.</b>
<i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	
In terms of formality, my main concern is the insufficient description of the model geometry and the computational model by the author. I think that presenting numerous graphs of residual developments and the development of integral values of total pressure does not contribute anything. The author fails to refer to the images and graphs included in the text of the thesis.	

<b>Selection of sources, citation correctness</b>	<b>D - satisfactory.</b>
<i>Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?</i>	
The author cites many publications in a way that is not usual at our faculty, and I consider it to be non-standard. From the text provided, I have doubts about whether the author has read some of the cited works, as studying all of them would be extremely time-consuming. Some of the cited works, in my opinion, are not appropriately chosen.	

**Additional commentary and evaluation (optional)**

*Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.*

Based on the thesis text, it seems to me that the author did not discuss it with the thesis supervisor.

**III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE**

*Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.*

**Questions:**

- 1) From the works you have cited, select up to five and explain in detail what they contribute to the problem you are studying. Bring these works to the defense and directly show their relevance.
- 2) Thoroughly explain why references 36 and 37 were chosen.
- 3) On page 19, you mention that the computational mesh was tested and is suitable for simulation. How did you test the computational mesh? Did you examine the influence of the mesh on the results of the numerical simulation?
- 4) Why do you think the reviewer does not consider the use of the polynomial on page 25 appropriate? Suggest another approach that is applicable in Ansys Fluent.
- 5) Provide a detailed description of the geometry of the outlet channels and explain how to calculate the loss coefficient. Use relevant literature to support your approach.
- 6) Consider the flow in a parallel piping system. Using fluid mechanics equations, explain what determines the flow rate through each pipe. Are there any conclusions from this that can be applied to your work?

The grade that I award for the thesis is **D - satisfactory**.

Date: **5.6.2024**

Signature: