

I. IDENTIFICATION DATA

Thesis title:	Wind tunnel design
Author's name:	Muhammad Iqbal Suleman
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Civil Engineering (FCE)
Department:	Department of Process Engineering
Thesis reviewer:	Ing. Pavel Rensa
Reviewer's department:	FCE - Center of Aviation and Space Research

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>How demanding was the assigned project?</i>	
I evaluate assigned project as challenging as wind tunnel design is not often designed device, not available on the market as of the shelf product. Its design is usually tailored to customer specific needs and application or it is even completely in-house developed solution, so student had to look for appropriate literature to gather information and for guidance.	

Fulfilment of assignment	fulfilled with minor objections
<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>	
Thesis fulfills requirements for research scope of the assignment, as wind tunnel layouts, design and measurements principles had been described. Proposed tunnel and measurement specification are focused on simple design easy to manufacture and allowing for use of advantage of detachable wall, where instrumentation and test sample can be prepared out of tunnel and just installed. It is not utilizing full potential offered by 3D printing technology with respect to design principles described in thesis research chapters. Tunnel manufacturing and evaluation wasn't accomplished because of objections mentioned in thesis.	

Methodology	correct
<i>Comment on the correctness of the approach and/or the solution methods.</i>	
I considered approach as a properly selected, but not fully followed and completed. Thesis just lays out couple requirements (FDM, test section size) and constrains for design, but it is not clear why or what bring it into the process. Requirements and constrains should be followed by brief clarification and problem description, which together with outcomes from research part could form goals for tunnel design and simple and clear guideline for the design process. Proposed tunnel manufacturing and verification of reached parameters to predicted values complies with common standards for design process completion, although not accomplished.	

Technical level	C - good.
<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>	
Thesis achieved a good level, but it just lays out couple requirements (FDM, test section size, detachable wall) and constrains for design, but it is not clear why or what bring it into the process (blower size, space restriction and test section given by old tunnel, open / closed return). Missing brief introduction into the problem prevents from setting of clear goals for design, acceptance criteria for the design and following simple evaluation for goals achievement, although research part provides good guideline for design process. Considering selected methods of measurement, advantages and disadvantages of manufacturing method should be assessed with respect to measurement quality, because FDM with PLA filament can produce surface with quite high roughness, affecting tunnel performance.	

Formal and language level, scope of thesis

C - good.

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?

Thesis shows standard formal level, it is organized in logical way. With respect to the scope and space provided to general tunnel overview, thesis could pay a little more attention to proposed tunnel design taking advantage from FDM technology. I consider proposed tunnel manufacturing and especially verification of reached parameters as nice to have and almost out of scope for bachelor thesis, especially from available time point of view. Language level is also standard, in order to avoid of useless spelling mistakes I recommend to do not rely on MS Word automatic corrections only.

Selection of sources, citation correctness

B - very good.

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?

From my perspective student was active in research of guidance materials for wind tunnel design and details and used relevant resources for it. Citations meet common requirements and standards.

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.

Assigned scope have a potential which could be better exploited, especially with respect to 3D printing. FDM allows for more complex design which can be successfully used even in small, simple wind tunnel design. In opposite wind tunnel design has a high level of complexity with respect to details precision and such scope, especially if combined with proposed design manufacturing and evaluation, is topics more for diploma thesis.

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.

In overall student fulfilled with assigned scope and demonstrated ability to use gained knowledge and work independently. I evaluate the work done on research part positively, but student didn't use full potential of assigned scope at least on level of goals for design process outcomes as well as on utilizing 3D printing advantages.

Question 1: Describe the difference between Pitot probe and Prandtl probe

Question 2: Describe advantages and disadvantages of 3D printed tunnel in comparison to commonly used materials like wood and steel

The grade that I award for the thesis is **C - good.**

Date: **28.1.2021**

Signature: