THESIS SUPERVISOR'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**MIXTURE HOMOGENEITY EVALUATION FOR CNG PORT FUEL INJECTION**
Author's name:	**Shubham Bawkar**
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Ú12120
Thesis reviewer:	Ing. Jiří Vávra, Ph.D.
Reviewer's department:	Ú12210

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment **ordinarily challenging**

How demanding was the assigned project?

The original experimental assignment had to be modified due to the changed situation.

Fulfilment of assignment **fulfilled**

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.

The student completed all the necessary parts of the assignment.

Activity and independence when creating final thesis **C - good.**

Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.

The student worked independently and presented progress regularly. Consultations were carried out bi-weekly using web meetings. However, due to limited technical background in elementary design, construction and the technical drawings skills, the student needed to be supervised almost on daily basis. On the other hand, the student showed a lot of effort and activities in learning a new and complex CFD software. He prepared and completed the CFD steady state study of the mixture homogeneity. Beyond the original assignment, he prepared the model for more demanding and hence more realistic transient CFD simulation.

Technical level **C - good.**

Is the thesis technically sound? How well did the student employ expertise in his/her field of study? Does the student explain clearly what he/she has done?

The majority of the work performed was described clearly and comprehensively in the thesis report. The major issue is with the chapter 4.2. The student analyzed the fuel consumption per engine working cycle. Unfortunately, he uses units of the fuel mass flow rate per hour instead of mass flow rate per cycle, which is confusing. The analysis of the CFD results should be performed in a more detailed way. The velocity vectors and streamlines plots would be helpful.

Formal level and language level, scope of thesis **B - very 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?

Language is consistent and understandable..

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?

Please insert your comments here.

CTU CZECH TECHNICAL UNIVERSITY IN PRAGUE

THESIS SUPERVISOR'S REPORT

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.
Please insert your comments here.

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.

Due to coronavirus situation, the submitted work is a result of the substitute assignment.

Mr. Bawkar prepared a design integration of the commercially available components on the experimental gas engine. In the next step he prepared the model with a fixed geometry for a steady state 3D CFD simulation.

Within his five-months internship Mr. Bawkar was able to learn basics of the setup of a complex 3D CFD model.

He carried out basic steady state simulations in a single operational mode with simplified boundary conditions. The analysis of performed simulations might be interpreted in a more detailed way. Due to lack of time, any injector geometry optimizations have not been performed. However, the presented work is a good initial work for future studies.

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

Date: **26.8.2020** Signature: