THESIS SUPERVISOR'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Development of an inspection system for the fast detection of topographic defects on bipolar plates surfaces by means of laser grid projection**
Author's name:	**Sara Menetrey**
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Automobiles, Internal Combustion Engines and Rail Vehicles
Thesis reviewer:	Jan Macek, thesis supervisor
Reviewer's department:	As above

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment **extraordinarily challenging**

How demanding was the assigned project?

The thesis topics combined experimental research of bipolar plates manufacturing technology results with design of form quality evaluation by image processing using laser grid projection. Graduating student had to combine his general knowledge, obtained in master courses, with very new specific know-how, based on literature sources and her own experience.

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 elaboration of thesis topics was done in limited time very well, although the work at Fraunhofer Institute IWU depended on the availability of specimens for laboratories in experimental part of the diploma project.

Activity and independence when creating final thesis **A - excellent.**

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's approach was active and regular consultations with the supervisor were carried out. The diploma thesis elaboration was well planned, which is reflected by the text itself. The unusual topics, at least for the student of mechanical engineering, required studying of literature, which was well and systematically mastered. The changes in surface quality elaboration process were not caused by her personally but they reflected the completely new field of research, in which, e.g., the planarization of large-scale deformation of plates created an obstacle, since support by transparent material plate caused an optical obstacle. Instead, the artificial 3D printed specimen and simple metallic discs were used for initial verification of algorithms.

Technical level **B - very 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 thesis is based partially on know-how of the hosting IWU Fraunhofer Institute. The supervisor is not able to assess the student's contribution in details, since the research was done outside of supervisor's department, but the contents of the thesis is sound. The strategical goal evaluation may have been done using deeper description of details of manufacturing technologies, which are decisive for presence of surface form deviation and it may have proved better student's understanding of the broader context of FC bipolar plates issues.

Formal level and language level, scope of thesis **A - excellent.**

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?

The formal side of thesis is at a good level. The thesis is well structured and easy to reading, with sufficient explanations of all facts in a logical way. As a non-native speaker I am not able to assess language correctness.

Selection of sources, citation correctness	**A - excellent.**
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?	
The student's contribution is sufficiently explained. The citations to formal sources are done in satisfactory way. The supervisor is not able to assess the own student's contribution and the result of collaboration in FI IWU due to reasons, mentioned above.	

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.
Question for defense: What is the practical meaning of surface geometry deviations for features of gas distribution along a bipolar plate.

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

The thesis was elaborated in the field partially new for the student from vehicle design specialization, although it is linked to elements of tribology, being touched in some course subjects. There are only minor inconsistences in description of works done during design of experiments and own experiments.

The grade that I award for the thesis is **A - excellent.**

Date: **21.8.2022** Signature: