THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Design of a Safety Shutter for Laser Beam**
Author's name:	**Ebrar Yücel Odabaş**
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Instrumentation and Control Engineering
Thesis reviewer:	Ing. Bc. Šárka Němcová, Ph.D.
Reviewer's department:	Instrumentation and Control Engineering

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment — **ordinarily challenging**

How demanding was the assigned project?

The project covers standard topics of mechanical engineering.

Fulfilment of assignment — **fulfilled with major objections**

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 shutter design and the thermal analysis was done. The thermal analysis was done in a way that the effect of the fins it is not clearly proven. The mechanical design is not finished, some parts are just preliminary ideas, not real elements (cooling channel, main box, mirror holder to actuator attachment).

Methodology — **partially applicable**

Comment on the correctness of the approach and/or the solution methods.

The approach of the thermal analysis is generally correct. Parameters and boundary conditions of the analysis are not thoroughly explained in the text. The choice of cooling channel's material is justified well. The explanation of fins' design is missing. Other designs of the mirror movement are not discussed. There is only a poor review part.

Technical level — **E - sufficient.**

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?

Technical level is low for a master thesis. More thorough thermal analysis would be appropriate. The mechanical design does not take into acount the manufacturing technology (mounting elements), consists of needles parts, the assembly design is not finished. There are incorrect calculations of photon energy and shutter speed. The purpose of the rubber ring (page 16) is misunderstood.

Formal and language level, scope of thesis — **D - satisfactory.**

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 theoretical part is mixed with the practical part. The English is difficult to understand. Technical terms are not consistent (fins, blades and wings used for the same part in two successive sentences). Thermal analysis is well presented, yet too briefly. It is not made clear what is the type of laser and which wavelengths are used. Equations are not written in a correct mathematical form (pp 11 and 12).

Selection of sources, citation correctness — **F - failed.**

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?

Only 10 references are listed, all of them are online sources, moreover not cited according to any standard. Authors statements are often not supported by a citation (for ex. the diameter/thickness ratio of laser mirrors).

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

The author performed acceptable thermal analysis, even though the effect of fins is not visible in the pictures. Neither the method of fins design was explained. The mechanical design is correct in principle, but is not finished: the box assembly, the cooling channel assembly and the connection of the chiller, the mirror holder connection to the actuator stage. The calculation of the shutter closing time is based on the maximum speed of the actuator only, which is principally incorrect. The mirror holders are non-manufacturable and not rigid enough.

The grade that I award for the thesis is **E - sufficient.**

Questions:

1. How is the mirror mount attached to the actuator stage?
2. What is the purpose of the rubber ring?
3. Have you tried another number and thickness of the fins?
4. How is the cooling channel fitted to the box without any water leakage?

Date: **14.9.2021** Signature: