

DIPLOMA THESIS EVALUATION

Student's name and surname: Ram Kumar Ramesh

Name of the diploma thesis: Innovation of motion axes for laser machine

Supervisor of the thesis: Ing. Petr Zelený, Ph.D. (Department of Manufacturing Systems and Automation, FME TUL)

1. Diploma thesis evaluation

Evaluation	excellent	excellent minus	very good	very good minus	good	failed
Meeting the goal and fulfilling task of the thesis			X			
Quality of conducted survey		X				
Methodology of solutions			X			
Expert level of the thesis				X		
Merit of the thesis and its potential applicability of results				X		
Formal and graphic level of the thesis		X				
Student's personal approach			X			

Mark x in the corresponding box.

Supervisor's final evaluation is based on his/her overall subjective evaluation.

Grading is stated literally in the article no. 5, neither by a number, nor by a letter.

2. Comments and remarks on diploma thesis:

The thesis assignment came from the department. The main objective of this thesis was to propose modifications of the linear axes on the laser cutter to achieve better dynamic parameters. The aim was partially achieved.

Theoretical part: That's more than half of the thesis. The author made a research of possible types of linear actuators and compared them with each other in an overview table. The author has made a survey of machines on the market that are similar in design to the laser cutter in the laboratory, focusing on the type of drives. The chapters are always concluded with an overview table. This section is supplemented by a number of figures and diagrams. I appreciate the work with sources, the author has demonstrated the ability to search for information and process it clearly. Citation sources are properly listed.

Practical part: It is not clearly separated and mixed with the theoretical part. Based on research, the author proposes two types of actuators, namely a ball screw and a linear electric motor. First, the author calculates the parameters of the current motion axis arrangement. According to the result, he then proposes changes in some parameters (e.g. screw diameter or pitch) to achieve the desired feed rates. The author indicates what all will have to be changed in the design when the above values are changed. Unfortunately, this is not worked out in detail for incorporation into the existing machine design. The second option is a linear electric motor. Here only the type and its comparison with a ball screw unit is given.

The dynamic aspect is missing in the calculations. Moving masses and change of masses when changing linear axis types are not accounted for. For this reason, and for not elaborating on the incorporation of the proposed

linear axes into the existing structure, I consider this section incomplete. The text is clear and supplemented by a number of figures and tables.

The author worked independently and consulted the thesis within the possibilities given by the pandemic measures.

3. Questions about diploma thesis:

Why is the length of the linear electric drive listed as 5 metres on page 67, Table 15?

Will the masses of the moving masses change when the type of linear actuator is changed?

4. Supervisor's statement on results of the inspection carried out by the anti-plagiarism program in the STAG system:

The system for checking plagiarism did not find any matches with other documents. The author lists the information sources according to the standard and refers to them properly in the text.

5. Supervisor's grading of the diploma thesis:

I suggest graded Very good.

Date: 21. 6. 2021, in Liberec

.....
Supervisor's signature

