OPINION

on the dissertation work
for the acquisition of the educational and scientific degree "Doctor" in

the field of higher education - 5 "Technical Sciences",
professional field - 5.1 "Mechanical Engineering",
doctoral program - "Cutting of materials and cutting tools"

Author: Mag. Eng. Georgi Veselinov Karlovski
Topic: "Study of the parameters of the turning process when working with quick-change tool holders"

Member of the scientific jury: Prof. Dr. Eng. Valyo Nikolov Nikolov

1. Topic and relevance of the dissertation

In the developed dissertation on the topic: "Study of the parameters of the turning process when working with quick-change toolholders", an innovative design of a universal tool holder is proposed, through which to improve the efficiency of the technological process when processing rotary parts on Swiss-type CNC lathes.

The present study is relevant, both from a theoretical and practical point of view, as it is necessary to apply a systematic approach in the development and implementation of innovations, effective strategies and applications to increase the efficiency of the production of parts with multifunctional machining centres, which allow the sequential and even simultaneous implementation of different processes with one grip and on one setup.

2. Research methodology

The research presented in the work has been carried out with modern and adequate methods and technical means for solving the tasks. Methods for modelling, statistical processing and analysis of experimental results, planning of experiments and optimization with specialized software have been applied.

I believe that the chosen research methodology is in accordance with the set goal of the dissertation: to optimize the cutting mode when turning on CNC machines with an innovative design of a quick-change tool holder, in which the main tasks have been solved and the following results have been obtained:

- An innovative design of a quick-change tool holder for CNC turning machines has been developed.
- A comparative study has been conducted and graphical dependences of the parameters (average roughness - Ra and tool durability) of the CNC turning process have been constructed when machining with a monolithic tool holder and with the created innovative quick-change holder.
- The influence of the lubricating-cooling fluid supplied through the body of the innovative quick-change tool holder on the average roughness of the processed surfaces has been studied.
- Mathematical models have been built for the influence of cutting speed and feed on the average roughness and durability of the cutting insert when using the innovative tool holder design.

- Cutting conditions for CNC turning have been optimized when using the innovative quick-change toolholder.

3. Contributions of the dissertation

I believe that the contributions are formulated by the dissertation candidate adequately, have a scientifically applied and applied nature and reflect the content of the dissertation.

They can be accepted as: formulating and substantiating a new hypothesis, proving with new means significantly new aspects of known scientific theories, creating new methods, constructions, schemes and technologies, and obtaining corroborating facts. In solving the assigned tasks, the dissertation candidate demonstrates proficiency in applied software products and measurement techniques through modern technologies and systems.

4. Publications and citations of publications on the dissertation

The main parts of the dissertation are presented in five scientific articles, four of which in national specialized journals and one in an international refereed collection. Two of the publications are independent and three are co-authored, with the doctoral student being the first author in them, which reflects his leading role in conducting the research.

I am not aware of citations of the publications submitted to the dissertation.

5. Authorship of the results obtained

I believe that the dissertation candidate shows a very good knowledge of the issues and adequately interprets the literary material - he cited 138 sources, of which 11 are in Cyrillic, most of which are contemporary and on the topic of the dissertation, which is an indicator of in-depth knowledge of the problem being solved and has a leading role in conducting the research based on the two independent publications and the three collective ones, in which he is in first place.

6. Opinions, recommendations and remarks on the dissertation

I believe that the dissertation has been developed at a good scientific level and solves current problems related to the application of an innovative design of a universal tool holder, through which to improve the efficiency of the technological process when processing rotary parts on Swiss-type CNC lathes.

I have the following recommendation to the doctoral student: the main results obtained from the dissertation work should be popularized abroad and applied in the training of students and doctoral students.

7. Conclusion

I believe that the presented dissertation meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria. The achieved results give me reason **to propose** that the educational and scientific degree **"Doctor"** be acquired by **Mag. Eng. Georgi Veselinov Karlovski** in
field of higher education - **5 "Technical Sciences"**,
professional field - **5.1 "Mechanical Engineering"**,
doctoral program - **"Cutting of materials and cutting tools".**

29.08.2025

Signature:
/Prof. Dr. Eng. Valyo Nikolov/