OPINION

by Assoc. Prof. Tsanko Vladimirov Karadzhov, PhD, Eng., Technical University of Gabrovo
on the materials submitted for the competition for the academic position of Associate Professor in

Higher Education Field 5. Technical Sciences,
Professional Field 5.1. Mechanical Engineering,
Speciality: Manufacturing Engineering

Candidate: Assistant Professor Kalin Vladimirov Anastasov, PhD, Eng.

1. Information on the competition

The competition for the academic position of Associate Professor was announced by the Technical University of Gabrovo in the Area of Higher Education 5. Technical Sciences, Professional Field 5.1. Mechanical Engineering, Speciality: Manufacturing Engineering. According to the candidate's application, the announcement was published in the State Gazette, No. 53 of 9 June 2026. This opinion is based on the submitted curriculum vitae, lists of publications and citations, summaries of research publications, statements of contributions, and the statement of compliance with the minimum requirements.

2. Information on the candidate

Chief Assistant Professor Kalin Vladimirov Anastasov, PhD, Eng., graduated from the Technical University of Gabrovo in Mechanical Engineering Equipment and Technologies, obtaining a Bachelor's degree in 2006 and a Master's degree in 2008. In 2016, he was awarded a PhD in the scientific speciality Cutting of Materials and Cutting Tools for his dissertation entitled "Investigation of the Performance of Cutting Tools Produced by Injection Moulding".

His professional career combines manufacturing, managerial and academic experience. He worked as a manufacturing engineer, deputy workshop manager and workshop manager at Arcus AD in Lyaskovets, and from 2018 to 2020 served as Director of Tool Manufacturing at Armaco Industries in Lyaskovets. He joined the Technical University of Gabrovo as an Assistant Professor in 2020 and has held the position of Chief Assistant Professor since 2024. This experience provides a sound basis for linking research and teaching to specific challenges in mechanical engineering production.

3. Overview of the content and results of the submitted research publications

A total of 28 research publications have been submitted for the competition: 14 under Indicator B.4, one under Indicator Г.7 and 13 under Indicator Г.8. The list also includes the textbook "Non-conventional Industrial Technologies" and the teaching manual "Coursework Guide for Tooling and Machines". According to the bibliometric statement, seven publications are single-authored, and 12 have appeared in journals with an impact factor.

The main research problem concerns controlling surface integrity by combining turning, surface plastic deformation and appropriate cooling conditions. The relationships between process parameters, surface roughness, microhardness, residual stresses, microstructure and the fatigue behaviour of components are examined.

Particular attention is given to diamond burnishing, toroidal roller burnishing, and the influence of prior machining on subsequent surface treatment, commonly referred to as technological inheritance. The studies cover austenitic stainless steels, structural steels, brass, and additively manufactured 17-4PH steel components. The other publications address the laser repair of dies, high-pressure die casting, corrosion resistance, and the capabilities of modern computer numerical control (CNC) machine tools.

The submitted statement reports 50 points in Group A, 199.5 points in Group B, 214.6 points in Group Г and 454 points in Group Д. These scores meet the minimum requirements for Associate Professor specified in that statement. The evidence of publication activity, citations and teaching publications supports a positive assessment of the candidate's research and teaching qualifications.

4. Impact of the candidate's research publications on the scientific community

The statement reports a total of 55 citations by other authors, including 43 in scholarly publications abstracted and indexed in internationally recognised databases and 12 in non-indexed peer-reviewed journals. The publications in international journals such as Machines, Metals, Applied Sciences and Materials, together with the reported citations, demonstrate the visibility of the research in surface treatment and the service reliability of metallic components. This provides positive evidence of the relevance of the problems addressed and the interest in the results obtained.

5. General overview of the candidate's activities

5.1. Teaching activities

Chief Assistant Professor Kalin Anastasov, PhD, Eng., has been engaged in teaching at the Technical University of Gabrovo since 2020. The submitted textbook on non-conventional industrial technologies and the coursework guide for tooling and machines are intended for students in mechanical engineering programmes. Their subject matter corresponds to the candidate's professional expertise and supports the incorporation of modern technological solutions into teaching. His experience in tool manufacturing provides a basis for practice-oriented instruction.

5.2. Research and applied research activities

The research is consistently directed towards improving the quality and performance of mechanical engineering components. The submitted studies combine design of experiments, regression analysis, finite element modelling, X-ray diffraction analysis and rotating bending fatigue testing. A strength of this work is the assessment of manufacturing processes using a range of indicators, including service performance, rather than surface roughness alone. Its practical focus is also evident in the studies of repaired die components and manufacturing process stability.

6. Contributions

I accept the main contributions set out in the author's statement of contributions and the extended habilitation report as contributions to applied research and engineering practice. They concern the development, investigation and optimisation of processes for modifying surface layers, and the identification of relationships between processing conditions and the service properties of metallic components.

Among the significant results is a theoretically substantiated and experimentally investigated method of surface plastic deformation using a toroidal roller with sliding contact, in which the angle between the roller and workpiece axes controls the contact kinematics. For AISI 316 steel, process parameters have been established that produce a surface roughness of Ra = 0.068–0.080 μm and beneficial compressive residual stresses. The developed diamond burnishing processes, under different lubrication and cooling conditions, achieve Ra = 0.041–0.049 μm and modify the condition of the surface layer.

The studies of sequential turning and diamond burnishing have value for applied research. The influence of cutting insert wear on surface integrity has been established. A mathematical model has also been developed for strain-induced martensite in the surface layer of AISI 304 steel as a function of the diamond burnishing parameters.

A further contribution to engineering practice is the development of a laser cladding process followed by nitriding to restore the working surfaces of steel die components.

7. Assessment of the candidate's individual contribution

The single-authored publications, first authorship of some of the joint papers, and the continuity of the research topics provide grounds for a positive assessment of the individual contribution of Chief Assistant Professor Kalin Anastasov, PhD, Eng. The submitted materials demonstrate his ability to formulate and investigate manufacturing problems independently and to work as part of a research team. I regard the results reported in co-authored publications as collective achievements to which the candidate has contributed.

8. Critical comments and recommendations

I accept the contributions set out in the author's statement of contributions and the extended habilitation report, as presented, as contributions to applied research and engineering practice. However, given their large number, I recommend consolidating them by thematic area, since a separate contribution is listed for almost every publication.

9. Personal impressions

My assessment in this opinion is based on the materials submitted for the competition. They present the profile of a researcher with practical experience in mechanical engineering, consistent research interests, and the ability to relate experimental results to specific manufacturing problems. The combination of engineering practice, research and teaching provides a sound basis for fulfilling the responsibilities of the academic position of Associate Professor.

10. Conclusion

In view of the foregoing, I recommend that the esteemed Scientific Jury award Chief Assistant Professor Kalin Vladimirov Anastasov, PhD, Eng., the academic position of Associate Professor in:

Area of Higher Education: 5. Technical Sciences,
Professional Field: 5.1. Mechanical Engineering,
Speciality: Manufacturing Engineering.

Date: 30 October 2026 Signature: _____

/Assoc. Prof. Tsanko Karadzhov/