O P I N I O N

Authored by Prof. D.Sc. Dimitar Andonov Dichev of Technical University – Gabrovo (TUG) concerning materials submitted for participation in competition for awarding the academic position of "Associate professor" in Field of Higher Education - 5. Technical Sciences, Professional Field - 5.1. Machine Engineering, scientific major "Manufacturing Technology"
Candidate: Chief assistant professor Kalin Vladimirov Anastasov, PhD

1. Information about the competition

The competition for the academic position of Associate Professor at the Technical University of Gabrovo was announced in the State Gazette, Issue No. 53 of 9 June 2026, and on the official website of the Technical University of Gabrovo, for the needs of the Department of Industrial Technologies and Design at the Faculty of Mechanical and Precision Engineering.

2. Information about the candidate

Only one candidate is participating in the announced competition – Chief Assistant Professor Kalin Vladimirov Anastasov, PhD, Eng., a full-time faculty member of the Department of Industrial Technologies and Design (ITD). The candidate fully meets the statutory quantitative and qualitative requirements of the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA), particularly those concerning the conditions and procedures for appointment to the academic position of Associate Professor.

Chief Assistant Professor K. Anastasov, PhD, Eng., holds a Master's degree in Engineering, specializing in Mechanical Engineering Equipment and Technologies, and a PhD in the scientific specialty of Metal Cutting and Cutting Tools, awarded following the successful defense of his doctoral dissertation entitled "Investigation of the Performance of Cutting Tools Manufactured Using the Injection Molding Method".

Dr. Anastasov began his academic and teaching career in 2020 at the Technical University of Gabrovo as an Assistant Professor in the Department of Mechanical Engineering Equipment and Technologies. Since 2024, he has held the academic position of Chief Assistant Professor. Prior to joining the university, he had acquired extensive professional experience in mechanical engineering. From 2018 to 2020, he worked as Director of Tooling Production at Armaco Industries in Lyaskovets. Between 2004 and 2018, he successively held the positions of Process Engineer, Deputy Workshop Manager, and Workshop Manager at Arcus AD in Lyaskovets. At the beginning of his professional career, he worked as a machine tool operator and fitter at the Lyaskovets facility of the State Enterprise TSV. He has substantial organizational and managerial experience in industrial production, including the management of a team of 120 employees. He is proficient in English and Russian.

3. Overview of the Content and Results of the Submitted Works

The scientific and educational works submitted by Dr. Anastasov for the competition can be classified into the following main categories: a habilitation thesis, scientific publications comprising articles in scientific journals and papers presented at scientific conferences, a textbook, and a teaching manual. An analysis of the materials submitted by the candidate shows that they meet and

quantitatively exceed the relevant minimum national requirements established by the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA), its Implementing Regulations, and the regulations of the Technical University of Gabrovo.

The habilitation thesis, presented in the form of 14 related scientific publications equivalent to a monograph, entitled “Combined and Hybrid Technological Processes for Modifying the Surface Layers of Metal Components”, brings together theoretical and experimental investigations aimed at improving the quality of surface layers and the operational performance of metal components. Particular attention is paid to combining machining processes with surface plastic deformation methods, including diamond burnishing and roller burnishing. The possibilities for controlling surface roughness, microhardness, residual stresses, and structural changes in surface layers through an appropriate selection of technological parameters and processing conditions are examined.

The research includes the development and experimental validation of combined and hybrid technological processes for machining various types of steels and non-ferrous alloys. The effects of technological heredity, cutting tool wear, and cooling conditions on the quality of machined surfaces and the fatigue life of components are analyzed. Mathematical models and optimization approaches have been developed to determine appropriate processing parameters, while the possibilities of applying environmentally sustainable processes with limited or no use of cutting fluids have also been investigated. The results obtained demonstrate the potential for substantial improvements in the surface characteristics, wear resistance, and fatigue strength of metal components, including those manufactured using additive technologies.

In addition to the publications included in the habilitation thesis, the candidate for the academic position of Associate Professor has submitted another 14 scientific publications, comprising articles in scientific journals and papers presented at scientific conferences. Particularly noteworthy is the high level of publication activity within the habilitation thesis, which includes 12 publications in scientific journals with an Impact Factor (IF) and two publications in journals with an SCImago Journal Rank (SJR). This demonstrates the international visibility of the research conducted and its dissemination through established scientific journals.

Dr. Anastasov's scientific publications cover a broad range of issues related to manufacturing processes in mechanical engineering and the improvement of the quality and operational performance of metal components. A significant part of the research focuses on analyzing the effects of cutting parameters, cooling conditions, and cutting tool materials on surface roughness, microhardness, and the condition of machined surfaces. The possibilities for optimizing technological parameters through designed experiments, regression analysis, and mathematical modeling are also examined. Another area of his publication activity concerns high-pressure die casting technologies for non-ferrous alloys, the restoration of die-forming surfaces through laser cladding, and the investigation of manufacturing process stability. The publications also present research on laser modification of tool steels, resistance to intergranular corrosion, the technological capabilities of computer numerical control (CNC) machine tools, and the application of additive manufacturing technologies for producing components with complex geometries.

The diversity of the issues addressed and the experimental and analytical approaches employed demonstrates a consistent research activity aimed at solving specific technological problems and improving the quality and efficiency of mechanical engineering production.

An analysis of the candidate's authorship shows that Dr. Anastasov is the first or sole author of 13 out of a total of 28 scientific publications, eight of which are single-authored. In the remaining publications, the candidate participates as a member of research teams, demonstrating active collaboration with other researchers in the development and experimental investigation of technological processes. It is noteworthy that the candidate predominantly holds a leading authorship

position in the publications outside the habilitation thesis, whereas the studies included in the habilitation thesis are mainly the result of collaborative research.

The textbook “Non-Conventional Industrial Technologies” (2026) systematically presents the fundamental theoretical concepts, physical principles, and technological characteristics of modern non-conventional material processing methods. It covers electrochemical machining, electrical discharge machining, electrocontact machining, and anodic-mechanical machining, as well as laser, plasma, ultrasonic, and abrasive waterjet technologies. Particular attention is paid to the technological capabilities, areas of application, and equipment used in the various processing methods. The textbook is intended for students in engineering degree programmes and represents a valuable source of systematically organized knowledge in the field of non-conventional manufacturing technologies.

The teaching manual for the course assignment in “Tooling and Machines” provides a systematic transition from theoretical knowledge to its practical application in the design and development of tooling equipment. Its content is organized in a clear methodological sequence, supporting students' independent work and contributing to the development of practical skills in solving specific engineering problems.

4. Impact of the Candidate’s Scientific Publications on the Research Community

The citation report submitted by the candidate indicates that Dr. Anastasov's scientific publications have attracted considerable attention within the international scientific community. In support of this assessment, I would point out that, of the 55 citations of his publications, 43 have been recorded in scientific journals indexed in the internationally recognized Web of Science and/or Scopus databases. Particularly noteworthy is the fact that a significant proportion of these citations refer to publications from the past two years, indicating the relatively rapid dissemination and use of the research results obtained. This gives me grounds to positively assess the international visibility of the candidate's research and to expect a further increase in the number of citations to his publications.

5. General Characteristics of the Candidate’s Professional Activity

5.1. Teaching and pedagogical activity

Chief Assistant Professor K. Anastasov is a university lecturer with extensive practical experience in the field of manufacturing technologies. He began his academic and teaching career at the Technical University of Gabrovo in 2020, with his previously acquired professional knowledge and skills in industrial practice providing a solid foundation for his development as a university lecturer. In support of my positive assessment, I would point out that the candidate has been entrusted with delivering lecture courses in seven subjects at the Bachelor's degree level and one subject at the Master's degree level, as well as conducting laboratory classes in a number of specialized courses. The subjects he teaches are directly related to his professional background and research activities, creating favorable conditions for integrating theoretical knowledge with practical experience in the education of students

5.2. Scientific and Applied Research Activity

The candidate for the academic position of Associate Professor has achieved significant scientific and applied research results in the fields of manufacturing technologies, materials processing, and the improvement of technological processes. His research focuses on the development and optimization of combined and hybrid processing methods, the modification of surface layers of metal components, and the improvement of their operational performance. The results obtained have a clear practical orientation and provide opportunities for enhancing the quality, reliability, and efficiency of manufacturing processes.

The candidate's research activities include participation in five projects, comprising one national project and four projects funded by the University's Research Fund. These projects address surface hardening of metallic materials, the investigation of tribological characteristics in surface

plastic deformation processes, and the development of new manufacturing technologies and tooling equipment. Dr. Anastasov has also actively contributed to the modernization of the department's laboratory facilities and technical infrastructure, including the equipping of laboratories for plastic injection molding and tooling production.

Chief Assistant Professor K. Anastasov's professional qualifications are further enhanced by specialized training in quality management, statistical data analysis, metallographic investigations, and technology transfer. I consider his scientific and applied research activities to have a strong practical orientation and to be fully aligned with the field of specialization in Manufacturing Technology.

5.3. Implementation Activity

The candidate's activities in implementing technological developments in industrial practice deserve high recognition, as the materials submitted for the competition include documentary evidence of the practical application of developed technological solutions in industrial production. Five official confirmation letters issued by Armaco Industries AD, Lyaskovets, and Easy Plast BG EOOD, Gabrovo, certify the implementation of technological processes for the heat treatment of tool and structural steels, the production of die-forming elements using additive manufacturing technologies, the manufacture of metal components by metal injection molding, the restoration of tooling equipment through laser cladding, and the laser welding of polymer components. I particularly appreciate the fact that these implementations were carried out under the candidate's supervision, demonstrating his ability to apply his professional knowledge and scientific and technological developments to solving specific industrial production problems.

6. Contributions. Significance of contributions for science and practice

The contributions presented in the candidate's statement of scientific contributions are classified into two main categories: scientific and applied contributions, and practical contributions. They are substantiated by the results of the theoretical and experimental investigations conducted and reflect consistent research activity in the field of manufacturing technologies. However, I believe that some of the contributions could be consolidated and summarized, which would allow the candidate's principal scientific achievements to be highlighted more clearly and formulated more precisely.

The scientific and applied contributions relate to the development and investigation of new and improved technological processes involving surface plastic deformation, diamond burnishing, and combined processing of metal components. Particular importance is attached to the established relationships between technological parameters, the condition of surface layers, and the operational performance of the processed materials, as well as to the developed mathematical models and approaches for optimizing technological processes.

The practical contributions have a clear engineering orientation and encompass the determination of optimal processing parameters, improvement of the quality of machined surfaces, enhancement of the wear resistance and fatigue life of metal components, and development of technological solutions for additive manufacturing and the restoration of tooling equipment.

Despite the observation made regarding the formulation and consolidation of the contributions, I consider that the scientific and applied research results obtained are of substantial importance for the improvement of manufacturing processes in mechanical engineering and provide a sound basis for their practical application.

7. Evaluation of candidate’s personal contribution

In my opinion, Dr. Anastasov's personal contribution to the results achieved in his teaching, scientific, and applied research activities is unquestionable and significant. His participation in research teams alongside established researchers demonstrates his ability to collaborate effectively in scientific research and to address complex technological problems. I consider the scientific results

achieved and the practical developments implemented to be convincing evidence of his professional competence, research capabilities, and organizational skills. I particularly appreciate his ability to combine his academic activities with direct responsibility for managing industrial production, which creates opportunities for a close connection between scientific research, student education, and the actual needs of mechanical engineering practice.

8. Critical remarks and recommendations

The merits of the materials submitted by the candidate, as outlined above, form the basis of my positive assessment of his scientific, applied research, and teaching activities. His scientific publications are distinguished by a consistent approach to the research conducted, sound experimental substantiation, and results of practical significance for modern manufacturing technologies.

I would recommend that Dr. Anastasov devote greater attention in his future research activities to summarizing and systematizing the results obtained, particularly when formulating and presenting his scientific and applied research contributions. I believe that these contributions should highlight the most significant scientific achievements and provide a clear and comprehensive overview of his overall research activities. Such an approach would contribute to the further development of his individual research style and to a more precise presentation of his scientific ideas and achievements.

As a direction for the further scientific development of Chief Assistant Professor K. Anastasov, I would suggest pursuing more in-depth research into combined and hybrid technological processes and expanding the opportunities for their practical application in industry. I also believe that his considerable experience in industrial production and scientific research provides a solid foundation for more active involvement in the training and supervision of young researchers and doctoral students.

9. Personal impressions

I have known Dr. Anastasov for more than ten years, since before he joined the academic staff of the Technical University of Gabrovo, and I have a very positive impression of his professional and personal qualities. He is distinguished by his sense of responsibility, integrity, collegiality, and commitment to continuous professional development. I highly appreciate his ability to combine scientific research and teaching activities with the responsibilities of managing industrial production, as well as his willingness to collaborate in addressing specific scientific and engineering challenges.

10. Conclusion

In view of the above, **I propose to the esteemed Academic Jury that Chief Assistant Professor Kalin Vladimirov Anastasov, PhD, be awarded the academic position of "Associate Professor"** in:

higher education area - 5. Technical sciences,
professional field - 5.1. Machine Engineering,
scientific major - Manufacturing Technology

28.10.2026

Prepared the opinion:
/Prof. Dimitar Dichev, D.Sc./