STATEMENT

in the competition for holding the academic position of Professor in the field of higher education 5. "Technical sciences", professional field: 5.1 "Mechanical engineering", academic discipline: "Programming of machines and systems with CAM", for the need of Department of Manufacturing Technologies and Machine Tools of the Faculty of Manufacturing Engineering and Technologies of Technical University of Varna, announced in State Gazette No. 67 / 04. 08. 2023.with single candidate: **Assoc. Prof. Stoyan Dimitrov Slavov, PhD, Eng.**

Member of the scientific jury: **Assoc. Prof. Georgi Stefanov Antonov, PhD, Eng.**

1.General characteristic of the candidate's scientific research and applied activity.

The single candidate admitted to participate in the announced competition for the academic position "Professor" is Assoc. Prof. Eng. Stoyan Dimitrov Slavov, PhD, Eng. (according to the Protocol No. 39 / 10. 11. 2023 of the admission of the candidates commission).

According to the minimum requirements for a Professor position regarding the Regulations for Holding Academic Positions in Technical university of Varna, the candidate has submitted scientific works that are summarized in the following groups of indicators:

1.1 Indicator A.1: Defended dissertation, developed on the topic "Technological capabilities of vibratory ball burnishing for control of some quality parameters and operational characteristics of flat surfaces" in the scientific specialty "Technology of Mechanical Engineering" in professional field 5.1. Mechanical Engineering.

1.2 For indicator B.3, a habilitation thesis - monograph is presented, which meets the requirement for 100 points for indicator in the group B.

1.3 A total of 289,3points were scored for indicator in the group Г:

- in Г.7 - scientific publications, refereed and indexed in world known databases with scientific information: 11 papers, 9 of which are indexed in the SCOPUS database and two in the Web of Science database. In six of the papers presented in this section, the candidate is first author. The total score for this indicator is 132,6 points.

- in the Г.8 - scientific publications in non-refereed peer-reviewed journals or in edited collective works: 12 works, of which 5 are independent, and in the remaining 7 the candidate is the first author. The total score for indicator Г.8 is 156,3 points.

1.4. Totally, 514 points were scored for indicators in Group Д, which are as follows:

- in the indicator Д.12 - the candidate has 17 cited scientific papers in 49 scientific journals, refereed and indexed in world-known databases with scientific information. Total for the Д.12 indicator - 490points.

- in the indicator Д.13 citations of 2 papers in one monograph are presented, 6 points.

- in the indicator Д.14 - 3 scientific publications cited in 9 non-refereed peer-reviewed journals, 18points.

1. 5. In the Group E - 394 points in total:

- One PhD student defended in the E.17 - 40 points.

- in the E.18 participation in three scientific and five educational national projects - 80 points.

- in the E.20 leadership of five scientific and one educational national projects - 120 points.

- in the E.22 the candidate attracted external funds via a national scientific projects funded by the Bulgarian National Science Fund - 24 points.

- in the E.23 two textbooks published by the candidate, which are used in training process at TU - Varna - 80 points.

- in the E.24: tree published university guidance for student, two of which are authored solely by the candidate - 50 points.

1.6. In the Group Ж: For the last three academic years, Assoc. Prof. Stoyan Dimitrov Slavov, PhD, Eng. has taught mostly lecture courses, which exceeds significantly the minimum number of points required (120 points) in the indicator Ж. In 2020/2021- 254,4 h; in 2021/2022 – 266 h, and in 2022/2023 - 247,8 h or he has a total score of 768,2 points.

2. Evaluation of the candidate's pedagogical training and activity.

Assoc. Prof. Stoyan Dimitrov Slavov, PhD, Eng. is an established lecturer in the Department of MTMT with over 11 years of experience as an associate professor. He teaches courses of lectures and laboratory exercises (total for the last three years 1442,10 h.) in the academic discipline "Programming of machines and systems with CAM" in full-time and part-time studies for the Bachelor of Computer Technologies in Mechanical Engineering, Mechanical Engineering and Technology, Production Engineering, etc. He has independently or co-authored 6 curricula in the disciplines he teaches. Under his supervision, there are 34 graduates in Bachelor and 19 graduates in Master degrees. He has reviewed a total of 19 theses. Works with students on various topics within the research projects presented in the reference. He has one PhD student that defended the doctoral degree and supervises three PhD students currently, who are at the process of training yet.

The reference on scientific production shows that the candidate for professor position has published two textbooks and three guidance on the disciplines he teaches.

All the above information proves the distinguished pedagogical capabilities and noticeable teaching activity of the candidate.

3. Main scientific and applied contributions.

Total amount of 24 publications were submitted for review in the current competition. They are consist of one monography, 11 publications that are refereed and indexed in world-recognized databases of scientific information (Scopus and/or Web of Science), D7.1 - D7.11, and 12 scientific publications, which are published in non-refereed peer-reviewed journals or edited conference proceedings or collective volumes, D8.1 - D8.12;

The contributions of the scientific production are defined as scientific and applied, applied and methodological.

The formulated scientific contributions are five and are related to the creation of an advanced concept to generate complex planar and spatial trajectories of the deforming tool; optimizing the required movement of the deforming element; the use of

mathematical models of the trajectory of the deforming tool for automated creation of numerical code for CNC machines; development of original approaches for automated cell count identification of fully regular reliefs; the identification of a group of uncorrelated three-dimensional criteria describing the complex topographic characteristics of the RRs (regular reliefs) obtained after BB (ball burnishing) process.

Six scientific and applied contributions are presented, which cover the computer models applied in practice to calculate the tool trajectories; the algorithms created: for the optimization of the trajectory length of the deforming tool for ball burnishing; for direct generation of control programs (or so-called. "ISO-code") for CNC turning centres; to build polylines in the widely supported by CAD and CAM software products DXF format (Autodesk), describing the tool path of the deforming element, in order to import them into suitable CAM software; to filter out the high-frequency components of the measured profilograms, by means of a "finite impulse response" filter, and resampling, allowing adequate spatial representation of the topography of the RRs as a 3D roughness or waviness patterns.

A generalized algorithm is also developed to analyze the degree of significance of the effects and the nature of the influence of the mode parameters of the BB process, as well as the trajectory of the deforming tool.

The claims concerning the applied contributions, are related to the creation of new, simpler and more compact designs of tools for the formation of RRs; by establishing the potential for increasing the number of cycles, and obtaining the maximum number of cycles to fatigue failure of austenitic steels specimens in the stress concentrator; determination of the influence of the magnitude of the deforming force and feedrate of the BB operation when processing aluminum alloys.

The candidate's long-term scientific and teaching experience and participation in several scientific and educational projects allow him to formulate four methodological contributions, which are related to the creation and testing: of methodologies for obtaining a three-dimensional topographic representation of the forming RRs by means of BB on planar surfaces; of a methodology for modelling the characteristics of RRs using a modern rapid prototyping method, namely creating three-dimensional models of RRs and printing them as physical objects using a 3D printer; of methodologies for measuring the deforming force and transmitting the measurements, both via a wired connection and wirelessly to computerized devices for acquisition and processing the measured data; of a methodology for establishing the influence of the main parameters of the BB processing regime parameters, and the sinusoidal trajectory of the deforming element on the topography parameters, and the cycle’s number to fatigue failure of the material for planar surfaces with a minimum number of experimental trials.

The presented scientific production and especially the reference for the candidate's citations under group of indicators D.12 in the section of scientific publications, refereed and indexed in world-known databases with scientific information, prove unequivocally that the mentioned above contributions are his personal work or were achieved with his significant participation.

4. Significance of contributions to the science and practice.

The claimed contributions are relevant to the subject of the competition. They are related to the expansion of scientific knowledge, enrichment of practice and training of

students in the field of computer technologies in mechanical engineering. From the presented references, especially from the many citations of the candidate's scientific publications, it can be seen that in terms of the stated contributions of the scientific works, in-depth theoretical and applied knowledge in the field of programming of machines and systems with CAM has been demonstrated.

Since the candidate is obviously well known among the scientific circles in Bulgaria and abroad, the presented scientific and applied contributions would find wide application in science and practice.

The data indicated in the submitted reference from the competition materials show that the minimum requirements for the quantitative indicators for the academic position of "Professor" at TU - Varna, and those in the Bulgarian national legislation have been met.

5. Critical comments and recommendations.

I have no significant remarks and/or recommendations to the presented scientific works and formulated contributions of the candidate.

CONCLUSION

I know personally the candidate for long time, and after assessing the documents in the current competition, the significance of the scientific works and the contributions contained therein, with his overall pedagogical, scientific research and scientific-applied activity, I can state confidently that the whole requirements are covered in full for occupying the academic position of "Professor", according to the Regulations for Holding Academic Positions in Technical university of Varna, and corresponding National legislation for holding academic positions in Republic of Bulgaria.

On this basis, I give my positive assessment and recommend the esteemed scientific jury to promote the candidature of **Assoc. Prof. Stoyan Dimitrov Slavov, PhD, Eng.** for holding the academic position of Professor in the Field of Higher Education 5.1. “Mechanical engineering”, and course "Programming of machines and systems with CAM".

Date: 3. 01. 2024 JURY MEMBE …….

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