REVIEW

on the materials submitted for participation in a competition for **"Associate Professor "**in the field of higher education 6. Agricultural sciences and veterinary medicine, Professional field 6.5 Forestry, scientific specialty "Machinery and equipment for the forestry, logging, woodworking and furniture industries "in the discipline "Woodworking machines "

In the competition for "Associate Professor ", published in the State Gazette, issue 102/08.12.2023 and on the site of the University of Forestry with the code WWIAsP-1123-116 for the needs of the Department of "Woodworking Machines "at the Faculty of Forest Industry, as a candidate participates Chief Assist. Valentin Atanasov Atanasov, PhD, Faculty of Forestry, Department of "Woodworking machines".

Reviewer: Prof. Veselin Stamenow Brezin, PhD, Professor in a Professional Field 6.5 Forestry, from the University of Forestry, retired.

1. Brief biographical data for the candidate

The candidate for the competition, Valentin Atanasov Atanasov, was born on 28.11.1981 in Kazanlak. From 1995 to 2000, he studied at Exarch Antim I High School, majoring in management. In 2001, he was accepted as a student at the University of Forestry, majoring in Woodworking and Furniture Production, graduating as a Bachelor of Engineering in 2008. From 2008 to 2009, he was a Master of Science student at the University of Forestry, majoring in Furniture Production. He was accepted as a full-time PhD student in the Department of "Woodworking Machines" from 2011 to 2014. In 2014, he defended his PhD thesis on "Investigation of the operational indicators of mobile horizontal bandsaw" with supervisor Assoc. Prof. Dr Zhivko Gochev obtained the educational and scientific degree "Doctor" in the scientific specialty "Machinery and Equipment for the Forestry, Logging, Woodworking and Furniture Industries". From 2014 to 2017, he studied for a master's degree in Computer Design and Technologies in Mechanical Engineering at the Faculty of Mechanical Engineering, Technical University, Sofia. Since 2019, he has been working as a part-time lecturer in the Department of "Mechanical Engineering Technology and Machines", giving a series of lectures and exercises on the subjects "Production Machinery and Production Techniques" to students from the "Faculty of Mechanical Engineering and "Industrial Technologies", from the Faculty of " Mechanical and technological" of Technical University - Sofia.

He has been elected as an assistant professor of "Woodworking Machines" at the Department of "Woodworking Machines", Faculty of Forest Industry. He leads exercises in the following disciplines: "Woodworking Machines", "Machines for Furniture Manufacture", "Design and Testing of Woodworking Machines", "Operation Exploitation and Maintenance of Woodworking Machinery", "Pressing and Surface Treatment Machines", "Machine Elements and Mechanical Science" (until 2021).

Conducts exercises for students from the Faculty of Forest Industry in the following disciplines: "Woodworking machines", "Machines for Furniture Manufacture", "Design and Testing of Woodworking Machines", Operation Exploitation and Maintenance of

Woodworking Machinery", "Pressing and Surface Treatment Machines" and "Computer simulation modelling".

2. Compliance of the submitted documents and materials of the applicant to the Regulation for the Development of Academic Staff at the University of Forestry.

The submitted documents and materials of the candidate, Chief Assistant Professor Dr Valentin Atanasov Atanasov, are under the requirements of Article 65, paragraph 1 of the Regulations for the Development of the Academic Staff at the Forestry University, as well as with the National requirements under Article 26, paragraphs 2, 3 and 6.

3. Assessment of the candidate's educational and pedagogical activities (work with students and PhD students)

The participant in the competition, Chief Assistant Professor Dr Valentin Atanasov Atanasov, worked for nine years and three months as an academic lecturer and successively held the position of Assistant Professor from 2014 to 2016 and from 2016 to the present, he had the academic position of Chief Assistant Professor. Atanasov gives lectures to students in the academic disciplines: Woodworking Machines", "Machines for Furniture Manufacture", "Design and Testing of Woodworking Machines", "Operation Exploitation and Maintenance of Woodworking Machinery", "Pressing and Surface Treatment Machines", "Machine Elements and Mechanical Science" (until 2021).

The lecture and scientific activity of the candidate is in the field of woodworking machines and, more precisely, experimental studies of woodworking machines intended for the processing of soft and hardwood, as well as wood-based materials - Medium-Density Fibreboard panels and plywood. Special attention is paid to the milling and longitudinal milling machines in this case. His multifaceted interests have enabled him to complete his studies in two master's programs. I would especially like to note that my assessment of Ch Assistant Professor Valentin Atanasov as an academic, researcher and specialist is high. Hardworking and humble, he enjoys a high reputation among the academic staff and students at the University of Forestry. His fluency in English enables him to continuously monitor and familiarise himself with the latest scientific research and innovations regarding woodworking machinery and equipment. As a lecturer, he is earnest, hardworking and erudite.

4. Assessment of the candidate's scientific, scientific-applied and publishing activities

General description of the submitted materials

Candidate Chief Assist. Prof. Dr Valentin Atanasov participated in the competition with:

- Monographs - 1 number;
- Textbooks - 0 number;
- Learning materials - 0 number;
- Books - 0 number;
- Publications - 33 numbers.
- Projects - 8 numbers.

4.1 Participation in scientific, scientific-applied and educational projects

- Research projects funded by the University of Forestry – 1 number;

- Infrastructure projects – 1 number;
- Scientific-applied projects funded by the Educational and Experimental Forestry of the University of Forestry – 6 numbers.

4.2 Characterisation of published scientific results

Scientific works presented by Ch Assistant Professor Valentin Atanasov Atanasov are mainly related to milling machines for wood and wood-based materials. They aim to solve theoretical and practical problems and analyse the results, conclusions, and recommendations to help practice.
The publications submitted by the candidate for participation in the current competition for the academic position of an "Associate Professor" can be classified as follows:

By type:
- Articles in scientific journals – 12 numbers.;
- Publications in Proceedings of Scientific Forums – 18 numbers.;
- Scientifically popular publications – none.

By significance:
- Articles in journals with Impact Factor (IF) – 1 number;
- Articles in journals referenced and indexed in Web of Science and SCOPUS – 7 numbers;
- Articles in specialised scientific journals that are not referenced and indexed in Web of Science and SCOPUS – 18 numbers;
- Proceedings of scientific forums – 12 numbers;
- Plenary reports – none;

Publishing place:
- Articles in Bulgarian and foreign journals referenced in Web of Science and SCOPUS – 7 numbers;
- Articles in reference Bulgarian and foreign journals referenced outside the Web of Science and SCOPUS – 4 numbers;
- Articles in non-referenced Bulgarian and foreign journals - 18 numbers;
- Publications in proceedings of international scientific forums - 21 numbers;
- Publications in proceedings of national scientific conferences, sessions and seminars – 2 numbers;
- Publications in scientific annals of universities and institutes – none.

Publishing language:
- In Bulgarian – 1 number;
- In a foreign language – 32 numbers;

Number of co-authors:
- Stand alone – 3 numbers;
- With one co-author – 3 numbers;

- With two co-authors – 9 numbers;
- With three or more co-authors – 20 numbers.

4.3 Reflection of Candidate's Scientific Publications in Literature (known citations)

- Total - 27 citations.

By type of citations:

- In reference journals and proceedings of scientific forums - 13 citations (from № Д13.1.1. to № Д13.9.1);
- In teaching aids, monographs, dissertations, etc. - 3 citations (from № Д14.1.1 to № Д14.3.1);
- In not reference journals and proceedings of scientific forums – 11 citations (from № Д15.1.1 to № Д15.6.3).

4.4 Contributions to the candidate's work (scientific, scientific-applied, applied)

The scientific works presented by the candidate are the result of the personal participation of Chief Assitant Professor Valentin Atanasov in the field of research and analysis of machines designed for processing solid wood and composite materials from it.

The candidate's contributions can be grouped into the following more essential fields:

- Power and energy studies of woodworking machines;
- Kinematic study of the milling process of different types of milling machines;
- Dynamic characteristics of milling machines;
- Operational and structural performance of woodworking machines.

The main contributions in the overall scientific and scientific-teaching work of the candidate can be summarised as follows:

- Scientific:

1. A methodology has been developed for research and analysis of the milling power of widely used wood species in the woodworking and furniture industry - oak (*Quercus petraea*), beech (*Fagus sylvatica* L.), pine (*Pinus sylvestris* L.), walnut (*Juglans regia*), spruce (*Picea abies*), meranti (*Shorea leprosula*), koto (*Pterygota macrocarpa*) and two wood-based materials - Medium-Density Fibreboard panels and plywood. (В.3.1; Г.7.9; Г.7.10; Г.7.12; Г.7.14; Г.8.8).

2. A methodology has been developed for research and analysis of cutting forces when milling widely used hardwood, coniferous, tropical wood species and wood-based composite materials (В.3.1; Г.7.5; Г.7.14; Г.8.6).

3. A methodology has been systematised for research and analysis of the influence of milling modes for softwood (*Pinus sylvestris* L.), hardwood (*Fagus sylvatica* L.) and tropical wood species (*Shorea leprosula*) widely used in the furniture industry. The range of variation of the speeds of working movements is determined depending on the quality of processing with longitudinal-plane milling machines (Г.7.1; Г.7.2; Г.8.2; Г.8.7).

4. Based on a mechano-mathematical model and a numerical study, a methodology is systematised for determining the forced spatial oscillations of a universal milling cutter and its spindle caused by an imbalance of the cutting tool and by actual cutting forces (Г.8.4; Г.8.9; Г.8.10; Г.8.14; Г.8.15).

- **Scientific-applied**:

1. A different methodology is proposed for the power design of cutting and feeding mechanisms of milling and longitudinal-milling machines. It differs from the existing ones by assuming that the consumed power of the electric motor at idle is 30% of its nominal (B.3.1).

2. The required cutting forces and capacities for different wood species and materials are determined. Based on experimental results, a classification was made, and graphic dependencies were built, which reveal the influence of the studied factors - cutting speed, feed speed and milling area (B.3.1; Г.7.5; Г.7.14; Г.8.6).

3. The effect of the design of the knife shaft in longitudinal milling of solid wood is determined (B.3.1).

4. A detailed solution of the statically indeterminate problem of the tensile stress in the sections of a bandsaw band tensioned by a spring mechanism is presented. The concentrations of the distributed loads, the sub-boundary friction, the solution of the fundamental integral, the application of Lopital's rule, etc., are analysed in detail. (Г.8.17).

- Applied:

1. The optimal conditions for working with a universal milling machine have been determined from the point of view of the power-energy parameters of the milling process (Г.7.5; Г.7.7; Г.7.9; Г.7.10; Г.7.12; Г.7.14; Г.8.6; Г.8.8).

2. A methodology has been developed to optimise the design process by applying classical methods for force, power, strength and deformation calculation of basic elements and assemblies of milling machines and modern CAD/CAE systems (B.3.).

3. Based on experimental studies, the recommended feed rates for milling and longitudinal milling machines have been determined (B3.1).

4. A circular log saw has been found to be approximately eight times more productive than a horizontal log saw used for the same purpose (Г.7.3).

5. It was found that by increasing the diameters of the belt pulleys in universal cutters, the number of belts can be reduced, as well as their cross-section (Г.8.13).

6. The allowable feed rate related to the cutting power of a bandsaw without a trimming milling unit is determined (Г7.15, Г.8.18).

7. A design of a belt grinding mechanism with a fixed support of the belt has been developed, with a low cost suitable for production in non-specialised production enterprises (Г7.8).

5. Assessment of the applicant's contribution

From the materials presented for the competition, I accept that a large part is the personal work of the candidate. The candidate's independent publications are 3, with one co-author also 3, and with up to two co-authors 9. In the case of joint publications, contribution protocols are not presented. Therefore, I assume that the participation of the individual authors is equal. This

fact indicates that the presented scientific, scientific-applied and applied contributions were achieved by the candidate or with his active involvement.

6. Critical remarks

To the candidate, Chief Assistant Professor Dr Valentin Atanasov, I have no critical severe comments since the materials presented for the competition were prepared following the requirements of the Regulations for the Development of the Academic Staff of the University of Forestry. The candidate has a rich scientific production, but I believe a little more effort should be made when working with students and graduates (he was the supervisor of only three graduate students). I highly recommend that he pay more attention to independent publications and write a textbook for students in further research and publication activities.

7. Personal impressions

The submitted materials for participation in the competition and my impressions of Chief Assistant Professor Valentin Atanasov as a student, doctoral student, and later a lecturer give me reasons to believe that the candidate is a well-rounded scientist and teacher in woodworking machines and tools. Hardworking, modest and ethical as a person and lecturer, he enjoys authority among his students and colleagues. His active participation in his scientific research work and excellent computer training allow him to solve various scientific and practical problems and tasks independently and in a team. I believe that with his hard work, knowledge and persistence, Ch. Assistant Professor Valentin Atanasov has established himself not only in the scientific direction of the competition in which he participated. Moreover, he still delivers a cycle of lectures and exercises at the "Faculty of Mechanical Engineering" and the Faculty of "Industrial Technologies" of the Technical University - Sofia on the design and management of a broad group of metalworking and woodworking machines, the equipment for machine tools, as well as a system of machines. These observations are an irrefutable fact and a recognition of his qualities as a lecturer.

8. Conclusion

The contemporary importance and positive assessment of good pedagogical activity and active participation in research give grounds to claim that the requirements of the Regulations for Development of the Academic Staff at the University of Forestry are met.

In connection with the above, I propose that Chief Assistant Professor Dr Valentin Atanasov Atanasov be elected as an "Associate Professor" in the discipline "Woodworking Machines" in the Professional field 6.5. Forestry, scientific speciality "Machinery and Equipment for the Forestry, Logging, Woodworking and Furniture Industries".

Signature of the reviewer:

Review submitted to: /Prof. Veselin Brezіv, PhD/