OPINION STATEMENT

on the materials submitted for participation in the competition for the academic position of **„Professor“** in the field of higher education 6. Agricultural sciences and veterinary medicine, professional field 6.5. Forestry, scientific specialty „Technology, mechanization and automation of the woodworking and furniture industry“, in the discipline „Furniture Technology“

In the competition for professor, announced in the State Gazette, issue 102/07.12.2021 and on the website of University of Forestry (UF) with procedure code WWI-P-1121-74, for the needs of the Department of Furniture Production (FP) at the Faculty of Forest Industry (FFI), as a candidate participates Assoc. Prof. Dimitar Hristov Angelski Ph.D., FFI, and Department of FP.

Prepared the opinion statement: Prof. Dr. Eng. Zhivko Bonev Gochev, in Professional field 6.5. Forestry, scientific specialty Technology, mechanization and automation of the woodworking and furniture industry“ (TMAWWFI) from the University of Forestry.

1. Brief biographical data about the candidate

Assoc. Prof. Dr. Dimitar Hristov Angelski was born on March 25, 1975 in Sofia, where he completed his secondary education at the Technical School of Textile technique. In 1999 he graduated as a master engineer in „Mechanical Technology of Wood“ at the FFI of the UF - Sofia. From 2000 to 2001 he was a part-time assistant in the discipline „Furniture technology“ (FT) at the FFI of UF. After a competition, in 2001, he was accepted as a full-time assistant in the discipline of FT at the Department of FP, FFI of UF. He has held the academic positions of Assistant (2001-2005), Senior Assistant (2005-2008) and Chief Assistant (2008-2015). In the period 2006-2009 he was a part-time assistant at the National Academy of Arts in the discipline „Technique and Technology“. In 2010 he defended the Educational and Scientific Degree „Doctor“ in the scientific specialty TMAWWFI.

Since 2015 he has been an Associate professor at the Department of FP, giving lectures in the following disciplines: FT, „Furniture Production“, „Technologies for decorative design of furniture“, „Technological design of furniture companies“. Since 2016, until now (second term) he has held the position of Deputy Dean for Educational work at the FFF.

Assoc. Prof. Angelski speaks English and Russian. He has specialized in related departments in Poland and Slovakia. He is a member of a number of scientific and organizational forums.

2. Conformity of the submitted documents and materials of the candidate with the required ones according to the Regulations for Development of the academic staff in UF.

The candidate for the academic position „Professor“ in the professional field 6.5 Forestry, scientific specialty TMAWWFI has submitted all the necessary documents required under Art. 65a (4) of the Regulations for development of the academic staff of UF and the Law for development of the academic staff in the Republic of Bulgaria.

3. Evaluation of the teaching activity of the candidate (work with students and Ph.D students)

Assoc. Prof. Dr. Dimitar Angelski has been working as a lecturer at UF - Sofia for 21 years. After his habilitation in 2015, Assoc. Prof. Dimitar Angelski is the holder of the following disciplines:

- „Furniture technology“ – specialty „Technology of wood and furniture“ (TWF), Bachelor's degree, full-time and part-time education.
- „Furniture technology“ – specialty „Engineering Design/Interior and Furniture Design“ (ED/IFD), Bachelor's degree, full-time education.

- „Furniture production“ – specialty TWF, Bachelor's degree, full-time education.
- „Technologies for decorative design of furniture“ – specialty TWF, Bachelor's degree, full-time education.
- „Decorative design of furniture“ – specialty Master's degree, full-time education.

His average classroom employment for the last five years is 375 hours.

Assoc. Prof. Angelski has prepared curricula for his disciplines, which were updated in 2017 and 2021.

The candidate was the scientific supervisor of a total of 53 successfully graduated students, and for the period from 2015 to 2021 they were 31, of which 25 Bachelor's and 6 Master's degrees. He was the scientific supervisor of the Ph.D. student eng. Vladimir Petrov Mihailov, who successfully defended on 04.01.2021 a dissertation on „Study of the processes for the formation and lining of bent furniture panels“. Assoc. Prof. Dimitar Angelski is also the research supervisor of Ph.D. Krassimira Aleksieva Alexandrova - Atanasova, which was deducted with the right to defense on February 2, 2022, and whose public defense before the Scientific Jury will be on June 6, 2022.

The participation of Assoc. Prof. Angelski as Deputy Dean for Educational work of FFI is active, already the second term in the accreditation of the two specialties at the Faculty: ED/IFD in professional field 5.13 General Engineering and TWF in professional field 6.5 Forestry; the initial accreditation of the scientific specialty „Ergonomics and Industrial Design“ and the program accreditation of the other three scientific specialties (Ph.D. programs) in the professional field 5.13 General Engineering. He is one of the initiators and active participant in the creation of the new specialty for Bachelor's degree at FFI called „Computer technology in the furniture industry“, directly aimed at Industry 4.0.

Assoc. Prof. Dimitar Angelski annually participates as the leader of 3 complex internships from specialties TWF, ED/IFD and Business Management.

His participation in the organization and conduct of training sessions with prominent specialists in the industry should not be overlooked. Assoc. Prof. Angelski was a trainer in 2017 and 2019 in two courses at the Center for Continuing Education at UF, in the field of Furniture technology.

Actively participates in the State Examination Commissions for the two ACDs in the specialty TWF and ED/IFD.

14 official notes, certificates and feedback are presented, which confirm the candidate's participation in various forums, events, public lectures and trainings organized by the FFI.

In conclusion, the pedagogical training of Assoc. Prof. Angelski and his teaching and organizational work are at a high professional level and fully meet the requirements for holding the academic position of „professor“.

4. Evaluation of the scientific, scientific-applied and publishing activity of the candidate

The candidate Assoc. Prof. Dr. Dimitar Hristov Angelski participates in the competition with:

- Habilitation work - 10 pcs. scientific publications in peer-reviewed publications from the Web of Science (WoS) and SCOPUS databases;
- Textbooks - 1 pcs.;
- Teaching aids - 5 pcs.;
- Publications - 40 pcs.;
- Projects - 9 pcs.

4.1 Participation in scientific, applied and educational projects

Assoc. Prof. Angelski has participated in 9 projects, of which 5 research and 4 educational projects.

4.2 Characteristics of published scientific results

- ❖ The presented in the competition 10 scientific publications on criterion B4, referenced and indexed in world-famous databases with scientific information - WoS and SCOPUS, formed as a habilitation reference, appropriately present the results of research work of the candidate related by refining furniture surfaces by lining them with sheet materials and by applying liquid compositions for the formation of a film with protective and decorative properties.
- ❖ Assoc. Prof. Dr. Dimitar Angelski was registered in 2019 in the register of the academic staff of NACID (National Center for Information and Documentation) as an „Associate Professor". For participation in the competition for the academic position „Professor" he presented 40 publications with which he did not participate in the competition for the academic position „Associate Professor", as well as during the registration in the register of the academic staff of NACID. The publications are in scientific journals and proceedings of international scientific conferences, most of them abroad, in the following editions:
  - Publications in scientific journals – 26 pcs. (65%):
- publications in impact factor journals (IF) WoS – 1 pcs. (2,5%);
- publications in SJR factor journals (SJR) SCOPUS – 10 (25%);
- in foreign scientific journals WoS and SCOPUS – 1 pcs. (2,5%);
- in Bulgarian refereed journals in WoS and SCOPUS – 3 pcs. (7,5%);
- in Bulgarian refereed journals outside WoS and SCOPUS – 11 pcs. (27,5%).
  - Publications in proceedings of scientific forums – 14 pcs. (35%):
- international refereed in WoS and SCOPUS – 3 pcs. (7,5%);
- in international proceedings of scientific forums – 9 pcs. (22,5%);
- in national proceedings of scientific forums – 2 pcs. (5%).
  - By importance, the publications in the competition number 50, published in journals and conference proceedings, can be classified as follows:
- in journals with IF and SJR – (IF - WoS) / (SCOPUS - SJR) – 11 pcs.;
- in foreign refereed journals in WoS and SCOPUS – 4 pcs.;
- in Bulgarian refereed journals in WoS and SCOPUS – 5 pcs.;
- in international proceedings of scientific forums referred in WoS and SCOPUS – 8 pcs.;
- in Bulgarian refereed journals outside WoS and SCOPUS – 11 pcs.;
- in international proceedings of scientific forums – 9 pcs.;
- in national proceedings of scientific forums – 2 pcs.
  - Place of publication is in:
- Place of publication is in - papers in papers at international scientific forums - 19: Croatia (4), Bulgaria (3), Hungary (1), Germany (1), RN Macedonia (1), Slovakia (1), Turkey 1), Slovenia (2), Bosnia and Herzegovina (3), Austria (2);
- articles in foreign journals – 15: Acta Facultatis Xylologiae (7), Annals of Warsaw University of Life Sciences – SGGW (2), Wood Material Science&Engineering (1), PRO LIGNO (2), Drvna Industrja (1), Key Engineering Materials (1) Energies (1);
- articles in national journals - 16: Governance and sustainable development (2), Sustainable development (3), Engineering sciences (1), Information technologies and control (2), Innovations in Woodworking Industry and Engineering Design (7). Materials, Methods and Technologies (1).
  - Language in which they are published:
- in Bulgarian – 7;
- in English – 43;
  - Number of co-authors:
- independent – 6;

- with one co-author – 9;
- with two co-authors – 13;
- with three or more co-authors – 22.

The scientific results and data published by Assoc. Prof. Dr. Dimitar Angelski and the data presented in NACID Appendix 2 form a total of 280 points in group B4 with minimum requirements of 100 points, and a total of 247.15 points in group G with minimum requirements of 200 points. This makes **227.15 points more than the minimum national requirements for holding the academic position of „professor" in a professional field 6.5. Forestry**.

No plagiarism was noticed in the materials published by the candidate in the competition.

4.3 Reflection of the candidate's scientific publications in the literature (known citations)

In the documents presented by Assoc. Prof. Dr. Dimitar Angelski is attached a list of a total of 25 known citations (excluding self-citations) of 20 of his works by other authors and copies of evidence.

According to the type of citations, they are divided as follows:

- Total - 25 citations.

According to the type of citations:

- In referenced and indexed editions - WoS and SCOPUS - 16 citations, including:
- In journals with impact factor (IF) - 4 citations;
- In journals with SJR rank journals - 12 citations.
- Citations in monographs and collective volumes with scientific review - 7 citations.
- Cited in unreferred journals with scientific peer-review - 2 citations.

According to the report presented in Appendix 2 of NACID, the total number of points in group D is 320 with a requirement of 100 points for the academic position „professor" in the professional field 6.5. Forestry.

The scientific and scientific-applied activity of Assoc. Prof. Dr. Dimitar Angelski can be assessed as significant and widely reflected in our country and abroad.

4.4 Contributions in the works of the candidate (scientific, scientific-applied, applied)

In this opinion, the object of evaluation of the candidate's contributions are 28 scientific papers from the total of 40 presented, as well as the habilitation report, including 10 articles in WoS and SCOPUS. The candidate's contributions in the following publications are not evaluated due to my co-authorship in them: №№ G7.3; G7.5; G7.6; G7.8; G7.12; G7.17; G8.4; G8.5; G8.6; G8.7; G8.8 and G8.9. The listed publications contain significant results in the field of the announced competition in „Furniture Technology" and in which publications Assoc. Prof. Dr. Dimitar Angelski has a well-deserved contribution.

The materials on scientific, scientific-applied and applied contributions are considered in five directions: „Plasticization and bending of furniture elements", „Facing of furniture surfaces", „Smoothing of wood surfaces in preparation for the formation of film protective decorative coatings" and „Other areas related to the production of furniture and wood products".

After analysing the scientific works of the candidate and his declared scientific, scientific-applied and applied contributions to the competition, can be accepted as:

❖ **Scientific contributions:**

- One-dimensional (1D) linear and nonlinear models for calculating the non-stationary temperature distribution along the thickness of solid wood parts subjected to unilateral heating for plasticization, based on the partial differential equation of thermal conductivity, have been compiled and solved.
- A methodology for mathematical modelling and study of the temperature distribution along the thickness of flat wooden parts subjected to one-sided heating before bending

and energy consumption by using the numerical solutions of the linear mathematical model has been developed.

- A methodology has been developed for calculation and study of 1D non-stationary temperature distribution when flat wooden furniture elements subjected to unilateral convective heating before varnishing and change of their average mass thermal conductivity, based on the differential equation of thermal conductivity in one-dimensional variant of this process.
- A mathematical model and numerical approach for calculating the specific energy consumption required for convective heating of flat furniture elements before their varnishing have been developed.
- A methodology for calculating optimal energy-saving modes for steaming prisms for veneer production in an autoclave with limited heat output of the steam generator has been developed.
- A mathematical description of the latent heat of the bound water in the wood during its freezing and melting of the formed ice in the cell walls of the wood has been developed.
- A methodology for mathematical modelling, calculation and research of 2D non-stationary temperature distribution in logs with periodically changing ambient air temperature in winter has been developed.

❖ **Scientific and applied contributions:**

- The change of the temperature field along the thickness of unilaterally heated wooden parts before their subsequent bending is calculated and the change of their average mass coefficients of thermal conductivity and thermal conductivity coefficients based on one-dimensional nonlinear mathematical model is determined.
- On the basis of numerical integration and differentiation of the solutions of a linear model for calculating the non-stationary 1D temperature distribution along the thickness of the parts, the non-stationary change of the specific heat flux required for heating flat spruce parts is established and graphically presented.
- The necessary energy consumption has been determined to cover the heat emission of spruce and oak details with an initial temperature of 20 °C, water content of 15% and different thicknesses during their one-sided heating at different temperatures of heating metal strip.
- A regime for production of curvilinear furniture details from glued HFB with high density thermos-vacuum membrane press has been drawn up on the basis of a proposed universal method for studying the formstability of the details.
- A mode for lining bent furniture elements with polyvinyl acetate foil (PVC) and polyurethane adhesive has been developed.
- The influence of the grain size of the sandpaper during grinding of the surface to be lined on the adhesive strength of adhesive joints between HFB and PVC foil has been established.
- The complex influence of the linearly distributed compressive load and the number of abrasions on the uniformity of the abrasion and the arithmetic mean of the heights of the micro-roughness's by friction with working bodies on a „solid" and „semi-elastic" basis has been established.
- It was found that the hardness of the veneer does not affect the quality of the smoothed by rubbing veneered furniture panels.
- Using the one-dimensional nonlinear mathematical model, the one-dimensional non-stationary temperature distribution and the average mass thermal conductivity of heated furniture elements before their varnishing were calculated.

- The complex influence of the feed rate and the amount of varnish on the adhesive strength and the degree of UV hardening of polyurethane coatings during pass-through application has been established.
- The primary influence of the number of applied layers on the arithmetic mean deviation of the lacquer coating profile in the successive phases of the film formation of the lacquer system has been proved.
- Energy consumption has been calculated and regimes for autoclave steaming of beech-containing and ice-free beech prisms with different cross-sectional sizes and water content have been developed.
- A simulation study of 2D non-stationary distribution of temperature, average mass temperature and three types of degree of icing of beech logs with industrial dimensions was made.

❖ **Applied contributions:**

- A trimming device with three constructions of working grinding bodies has been developed and experimentally applied, providing different formation of the bearing base - rigid, semi-elastic and flexible.
- The influence of the type of adhesive on the adhesive strength of the adhesive joints in the positional lining of wood particle boards with oak veneer has been established.
- Nomograms have been prepared to determine the final roughness and uniformity of the rubbed surfaces during deformation smoothing by rubbing with working bodies on a "hard" and "semi-elastic" basis by changing the regime parameters, linearly distributed compressive load and number of impacts.
- Nomograms have been compiled to determine the adhesive strength and the phase of UV curing when changing the mode parameters feed rate and the amount of varnish in the transient application of polyurethane coatings.
- It has been determined that ultraviolet radiation has the most adverse effect on the operational resistance of protective and decorative coatings applied to wood exposed to the weather.
- The adhesion strength of different types of paint coatings applied on spruce and oak wood has been determined.
- Nomograms have been drawn up to determine the arithmetic mean deviation of the profile of the acrylic lacquer coating by changing the grain size of the sandpaper, the amount of primer and the number of coats applied.
- It was found that the nano-based lacquer system forms a coating with higher adhesion strength and a surface with a larger arithmetic deviation of the profile compared to similar conventional lacquer systems.
- The water permeability of nano-based lacquer coatings applied to different wood species has been determined.
- High-performance technology for making imitation wood carvings from rigid moulded polyurethane foam is proposed.

5. Assessment of the personal contribution of the candidate

The documents, scientific papers and evidence submitted by the applicant are well structured and no significant gaps have been identified. Most of the results achieved in the materials submitted by the candidate in the competition are his personal work, as 6 of them are independent, and in 13 of the collective works he is in first place. Based on this, I accept that the above contributions to the competition for a professor are the personal work of the candidate or have been achieved with his active participation.

6. Critical remarks

In the works of the candidate and the presented creative achievements with which he participated in the competition, I did not find significant omissions such as wrong statements and approaches, incorrect methods and summaries or incomplete analysis of the results.

The scientific results published by Assoc. Prof. Dr. Dimitar Angelski and the data presented in the Appendix 2 of NACID by group D form a total of 247.15 points, and not 147.15 points presented in this way..

The contributions presented by the candidate can be summarized in a more concise and generalized form.

I would like to recommend Assoc. Prof. Dimitar Angelski to continue working actively and purposefully as a lecturer and scientist, passing on his experience to both students and doctoral students under his leadership.

7. Personal impressions

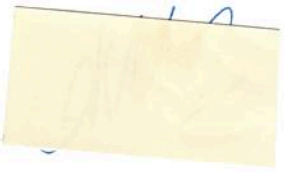
I have known Assoc. Prof. Dr. Dimitar since his student years. My personal impressions have expanded and shaped after his administrative position of Deputy Dean for EW and our joint, already 6 years of work in the management of FFI.

During these years he established himself as a good and respected teacher, scientist and administrative leader. It is distinguished by its modesty, collegiality, active work for the development of the faculty, as well as in the field of educational and scientific process.

With his many years of work as a scientist and lecturer, mastering and using modern computer technology and mathematical methods, Assoc. Prof. Dr. Dimitar Angelski has successfully entered, as a good professional, in the scientific field in which the competition was announced.

8. Conclusion

In connection with the above, I propose Assoc. Prof. Dr. Dimitar Hristov Angelski to be elected „Professor“ in the discipline „Furniture Technology“ in Professional field 6.5 Forestry, scientific specialty „Technology, mechanization and automation of woodworking and furniture industry”.



Prepared the opinion statement:

/Prof. Zhivko Bonev Gochev Ph.D/

The opinion was transmitted to: March 28, 2022