



OPINION

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 woodworking and furniture industry", in the discipline "Furniture Technology".

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

Prepared the opinion: Prof. Dr. Slavcho Assenov Sokolovski, Professor in Professional Field 6.5 "Forestry", scientific specialty "Technology, mechanization and automation of the woodworking and furniture industry" at the University of Forestry, retired

1. Brief biographical data of the candidate

The candidate Assoc. Prof. Dr. Dimitar Hristov Angelski was born on March 25, 1975. He graduated in 1999 and obtained his engineer degree in "Mechanical Technology" at the Faculty of Forest Industry, University of Forestry. In 2010 he defended his doctoral dissertation in the specialty "Technology, mechanization and automation of the woodworking and furniture industry" on the subject "Research on the processes of plasticization and bending of solid wood parts." He has 21 years of experience as a university lecturer. From 2001 to 2015 he was an assistant, senior assistant and chief assistant, and from 2015 onwards he is an associate professor in the Department of "Furniture Production". Since 2016 he is the vice dean of the "Faculty of Forest Industry". He has specialized in Slovakia (2014) and Poland (2018). He speaks English and Russian. The candidate is a member of a number of scientific and organizational committees of scientific forums.

2. Conformity of the submitted documents and materials of the candidate with the required ones according to the Rules of the Development of Academic Staff (DAS) at the University of Forestry

Documents and materials submitted by the candidate regarding the competition announced by the University of Forestry for the academic position "Professor" in the discipline "Furniture Technology", fully correspond to those required by the Rules of DAS in the University of Forestry. Presented diplomas are notarized. Legally certified references of teaching and research activities are presented. Moreover, documents for his educational and organizational activities and performances are presented. The candidate has presented his publications and abstracts in Bulgarian and English on electronic files, as well as information of his publication citations.

3. Assessment of the candidate's educational and pedagogical activities

The educational and pedagogical activity of Assoc. Prof. Dr. Dimitar Angelski is related to his work in the Department of "Furniture Production", where he gives lectures and practical training to students in the following disciplines:

Bachelor's degree

"Furniture technology" for specialty "Furniture and Wood Technology" (FWT) (full-time and part-time education) and specialty Engineering Design (ED) (full-time education). As well as, "Furniture production", for specialty ED (full-time education).

Master's degree

"Technologies of ornamental furniture design" for specialty FWT (full-time and part-time education) and "Ornamental design of furniture" for specialty ED (full-time education).

The candidate also conducts practical training in the following disciplines: "Materials and processes for providing protective and ornamental coatings" and "Processes for providing protective and ornamental coatings", "Technologies of ornamental furniture design" and "Design of park and forestry facilities from wood" (full-time and part-time education), "Furniture Manufacturing Workshop" (full-time education). The classes are carried out mainly in the Faculty of Forest Industry.

Assoc. Prof. Dr. Dimitar Hristov Angelski has participated annually and, in recent years, is the head of sophisticated practical trainings to students from FWT, ED and Business Administration (BA) specialties.

For the last five years the candidate has performed the pedagogical workload according to the rules of procedure at the University of Forestry. He has presented an official notice for his average teaching workload during the last 5 years, i.e.

- Lectures for full-time and part-time studies - 375 hours;
- Extracurricular activities and practical work - 140 hours;
- Total - 515 hours.

The planned teaching workload for the current 2021-2022 academic year is:

- Lectures for full-time and part-time studies - 337 hours;
- Extracurricular activities and practical work - 82 hours.

It should be noted in this official notice that as a Deputy Dean Assoc. Prof. Dr. Dimitar Angelski has had a 25 % reduced norm of annual academic employment.

The candidate has published 1 textbook (co-authored) and 5 manuals (in virtual libraries).

From 2018 until 2020, Assoc. Prof. Dr. Dimitar Angelski was a science supervisor of 3 Master's degree graduates and wrote a total of 30 reviews, of which 18 for Bachelor's degree and 12 for Master's degree.

Official notice is presented by the candidate concerning the his developed and updated pedagogical programs in the following disciplines:

Bachelor's degree

- "Furniture Technology" for the specialties FWT and "Computer Technologies in Wood Industry" (CTWI) (full-time and part-time education) and ED (full-time education);
- "Manufacture of furniture", for the specialty BA (full-time education);
- "CAD / CAM / CAE systems in furniture production" for the specialty CTWI (full-time education).

Master's degree

- "Technologies of ornamental furniture design" for specialty FWT, modules: "Manufacture of furniture" and "Conservation and restoration of wood products" (full-time and part-time education);
- "Ornamental design of furniture" for specialty ED, modules: "Product Design", "Habitat Design" and "Urban Environment Design" (full-time education).

The candidate has elaborated 16 reviews of educational curricula of disciplines from pedagogical programs.

Assoc. Prof. Dr. Dimitar Angelski was a science supervisor of one PhD student who successfully defended his thesis and one PhD student who is preparing his dissertation. He was also the supervisor of several successfully graduated students: Bachelor's degree – 47 students and Master's degree – 6 students from the specialties FWT and ED.

The candidate has given lectures to students at the Technical University of Resenheim, Germany and to students from the Department of Wood and Furniture Technology and Design at the Technological Training Institute in Larissa, Greece.

He was a member of the program council for the opening of the new specialty CTWI at Faculty of Forest Industry (FFI). The candidate has participated in committees for program accreditation of specialties from FFI and in committees of the Accreditation council at the University of Forestry. He has been frequently a member of the jury in competitions for academic positions and scientific degrees, and a reviewer of educational curricula and research projects.

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

General description of the presented materials:

Candidate Assoc. Prof. Dr. Dimitar Angelski participated in the competition with a total of 56 publications:

- Habilitation work - 10 scientific publications in issues that are referenced and indexed in world-famous scientific databases (Web of Science / Scopus) (topic: "Improvement of furniture surfaces");
- Textbooks – 1 (co-authored), 390 pages, published in 2014;
- Learning materials - 5;
- Publications (articles and reports for scientific forums);
- Projects - 17.

4.1 Participation in scientific, scientific-applied and educational projects

The scientific and scientific-applied work of Assoc. Prof. Dr. Dimitar Angelski is in the field of furniture production, which is completely in correspondance with the subject of the competition.

The candidate participates in the competition with 17 projects, of which:

- 5 research projects financed by the University of Forestry according to Regulation 9, and two of them were supervised by him (E18.1 to E18.5);
- 4 national educational projects (E18.6 to E18.9);
- 8 applied projects financed by the training experimental forestries of University of Forestry, and one of them was led by him.

Assoc. Prof. Dr. Dimitar Angelski was a member of 8 scientific and organizational committees of scientific forums. He has participated in 13 scientific conferences for which he has issued certificates.

4.2 Characteristics of the published scientific results

Assoc. Prof. Dr. Dimitar Angelski participates in the competition with a monograph on topic: "Improvement of furniture surfaces". It is elaborated on the basis of 10 scientific publications which are referenced in the World Databases for Scientific Information (Web of Science and Scopus) (B4.1 to B4.10). Three of them are published in international scientific journals, two in Bulgarian scientific journals and five of them are edited in volumes of scientific forums.

Two main ways of improving furniture surfaces are considered: by coating with sheet materials and by applying liquid compositions to form a film with protective and ornamental properties. A study has been conducted on the research work related to the adhesive strength of glues between coating materials and furniture panels. The smoothing process during the preparation of the surfaces on which the protective and decorative film coatings are applied is considered. The properties of the protective and ornamental coatings have been studied. The

candidate has cited 124 scientific sources. The habilitation work meets the requirements of the Law for development of the academic staff in Republic of Bulgaria and the Regulations for development of the academic staff in UF.

The submitted by the candidate for participation in the competition of a total of 50 publications, 31 are published in scientific journals and 19 in proceedings of scientific forums:

- in journals with impact factor - (IF - Web of Science) / rank (SCOPUS - SJR) - 11;
- in foreign referenced journals in Web of Science / SCOPUS - 4;
- in bulgarian referenced journals in Web of Science / SCOPUS - 5;
- in international proceedings of scientific forums referenced in WoS / SCOPUS - 8;
- in bulgarian referenced journals outside Web of Science and SCOPUS - 11;
- in international proceedings of scientific forums - 9;
- in national volumes of scientific forums - 2.

The majority of the publications are in English - 43, compared to those in Bulgarian - 7, of which 5 are individual publications and the remaining 45 are co-authored. Assoc. Prof. Dr. Dimitar Angelski is the first co-author in 14 publications, the second co-author in 10 publications, the third co-author in 17 publications and the fourth co-authored in 4 publications.

Classification of materials by groups of indicators of the minimum requirements for obtaining the academic position "professor", scientific field 6. Agricultural sciences and veterinary medicine, scientific field 6.5. Forestry is as follows:

- A1 – Dissertation for obtaining a "PhD" degree - 1 (A1.1);
- B4 – Habilitation work - 10 scientific publications in referenced and indexed editions pulshed in world-famous database with scientific information (B4.1 to B4.10);
- G7 – Scientific publications issued in referenced and indexed editions in a global database of scientific information (Web of Science and SCOPUS) - 18 (G7.1 to G7.18);
- G8 – Articles and reports published in non-referenced journals with scientifically reviewed or published in edited common volumes - 22 (G8.1 to G8.22).

Most of the publications reflect the results of the candidate's research work and formulate the achieved scientific, scientific-applied and applied contributions. The co-authored textbook covers contemporary knowledge for students and practitioners.

New methodological solutions for improving the protective and decorative properties of furniture surfaces are proposed. It is achieved by smoothing with rubbing of the surfaces and optimizing the process of applying paints and varnishes on furniture surfaces, by improving and optimizing the process of plasticization at bending of wood parts and the efficient use of wood.

Achieved significant results are widely popularized in his 56 publications issued in form of articles in scientific journals and as reports in volumes of scientific forums.

According to the group of indicators "G" from the legal minimum requirements, Assoc. Prof. Dr. Dimitar Angelski gathers a total of 225 points. The number of points required is 200 points.

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

The candidate has presented a list and evidence materials of determined by him 25 citations in 20 publications from which 16 citations in referenced and indexed editions in world databases - Web of Science and Scopus (D13.1 - D13.3), 7 citations in monographs and

common volumes with scientific review (D14.1 - D14.6) and 2 citations in non-referenced journals with scientific review (D15.1 - D15.2).

According to the group of indicators "D" from the legal minimum requirements, Assoc. Prof. Dr. Dimitar Angelski gathers a total of 320 points. The number of points required is 100 points, which exceeds by more than 3 times for a professor.

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

In the present opinion below, an object of evaluation of the contributions of the candidate are a total of 50 scientific publications. The abstract, the textbook and the learning materials are not included.

I consider it necessary to emphasize that the above-listed publications contain significant results, some of which are cited in prestigious editions.

After careful analysis of the presented results, in my opinion, the most important scientific, scientific-applied and applied contributions of the scientific work are:

Scientific contributions:

- Under certain boundary conditions, one-dimensional (1D) linear and nonlinear models are developed and solved to calculate the non-stationary temperature distribution along the thickness of solid wood parts subjected to one-sided heating for plasticization before bending (G7.1; G8.3). The energy consumption in this process is determined (G7.2, G7.4, G7.6, G8.8).

- The impact of the flexibility of the operating body for rubbing and the parameters of the technological regime on the quality of smoothing of veneered furniture panels (G8.11, G8.12) has been established on personal unconventional installation.

Scientific and applied contributions:

- It has been determined that the non-stationary variation of the temperature in different points of the thickness of spruce and oak details follows two increasing and interchanging exponential functions. First exponentials start from values equal to the initial temperature of wood, and second ones asymptotically approach the maximum values, decreasingly depending on the distance of the points relative to the heated parts surface (G7.1, G8.3).

- Variation of temperature field along the wooden parts thickness subjected to unilateral heating is calculated. Variation of average mass coefficients of thermal conductivity and coefficients of thermal conductivity of the unheated wooden parts surface is determined (G8.9).

- Approach of calculation the heat flux required for heating flat wooden parts by unilateral heating in order to plasticize them is developed. The calculation is determined by numerically integrating and differentiating the solutions of a linear model for calculation of the non-stationary 1D temperature distribution along parts thickness (G8.4).

- Energy consumption for covering the heat emission of spruce and oak details with initial temperature of 20°C, water content 15 % and different thicknesses during their unilateral heating at different temperatures of heating metal strip is determined (G7.2, G7.4, G7.6, G8.8).

- Form stability of curvilinear furniture details and units made of high density glued Panels from Wood Fibers (PWF) and with internal filling of slats is studied. Based on proposed and used universal method, a regime for the production of curvilinear furniture details is elaborated (G8.15, G8.18).

- Trimming device has been created, providing different supporting bases (rigid, semi-elastic and flexible) of the rubbing element and different feed rates (G8.11, G8.12).

- Method for calculation and study of two interrelated parameters has been developed: non-stationary temperature distribution during unilateral convective heating of flat wooden furniture elements and variation of their average mass thermal conductivity (G7.3, G7.5, G7.12, G8.5, G8.6).

- Mathematical model and digital approach for calculating the specific energy consumption required for convective heating of flat furniture elements before their varnishing has been developed (G7.8, G8.7).
 - Norm for coating of bent furniture elements with PVC foil and polyurethane glue (G8.16) has been developed.
 - Impact of the grain size of the sandpaper during grinding of the coated surface on the adhesion strength of glues between PWF and PVC foil (G8.17) has been established.
 - Complex influence of the linearly distributed pressure load and the number of abrasions on the uniformity and rubbing quality with operating bodies on a "solid" and "semi-elastic" basis has been established (G8.12).
 - One-dimensional non-stationary distribution of temperature and average mass thermal conductivity of heated furniture elements before their varnishing has been calculated (G7.3, G7.5, G7.8, G7.12, G8.5, G8.6, G8.7).
 - Two-factor experiment revealed the complex impact of feed rate and amount of varnish on the adhesion strength and the degree of UV hardening of polyurethane coatings during pass-through application (G8.18, G8.20).
 - Primary impact of the number of applied layers on the arithmetic mean deviation of the lacquer coating profile (G8.13) has been proved by three-factor regression models.
- Applied contributions:
- Impact of the type of glue on the adhesive strength of glues in positional coating of particle boards with oak veneer (G8.14) has been established.
 - Nomograms have been drawn up to determine the final roughness and uniformity of the rubbed surfaces during deformation smoothing by rubbing with working bodies on "hard" and "semi-elastic" support by changing the regime parameters, linearly distributed compressive load and number of impacts (G8.12).
 - Nomograms have been created to determine the adhesion strength and the phase of UV hardening when changing the regime parameters feed rate and the amount of varnish in pass-through application of polyurethane coatings (G8.18, G8.20).
 - It is determined that ultraviolet radiation has the most unfavourable effect on the operational resistance of protective and decorative coatings applied on wood exposed to atmospheric influences. It is established that long-term protective effect of coatings is achievable only in case of indirect effects of solar radiation on wood (G8.10).
 - Adhesive strength of different types of paint coatings applied to spruce and oak wood has been determined. It has been found that paints developed for making of coatings on silicate surfaces form coatings on wood with normative adhesion strength and can also be used for decorating wood construction products (G8.2).
 - Nomograms have been drawn up to determine the arithmetic mean deviation of the profile of acrylic varnish coating by changing the grain size of the sandpaper, the amount of primer and the number of coats applied (G8.13).
 - According to data and observations conducted on a nano-based varnish system, it is found that it forms a coating with higher adhesion strength and a surface with a larger average deviation of the profile compared to similar conventional varnish systems (G8.21, G8.22).
 - Water permeability of nano-based varnish coatings applied to wood from larch (*Larix spp.*), Meranti (*Shorea spp.*) and red oak (*Quercus rubra*) (G8.21) is determined.

5. Assessment of the applicant's personal contribution

After evaluation of the materials presented in the competition for "Professor" I consider that Assoc. Prof. Dr. Dimitar Angelski participates with scientific and research works that have been created individually (5 independent), and in those in co-authorship he has a leading role (he is the first co-author in 14 publications). In addition, as no separation protocols have

been submitted for the co-authored articles, I assume that the contributions and participation in them are equally distributed among the co-authors.

The listed above contributions by Assoc. Prof. Dr. Dimitar Angelski give me the ground to accept that they are individual contributions or have been achieved with his active participation. The achieved scientific, scientific-applied and applied contributions are significant for the academic specialty in which the competition "Technology, mechanization and automation of woodworking and furniture industry " is announced and will be useful in science and practice.

6. Critical remarks

I did not find any significant omissions in the evaluated works and the very well-prepared materials of the competition.

7. Personal impressions

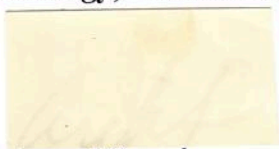
I have known Assoc. Prof. Dr. Dimitar Angelski since his student years as I was his lecturer and I have excellent impressions of him. As a lecturer he is responsible, communicative and highly erudite colleague. He is very respected by his students. His participation in dozens of scientific forums in Bulgaria and abroad, as a rapporteur and as a member of scientific and organizational committees, is an indicator of his competence and popularity.

The achieved results in the research, pedagogical and presented scientific and publishing activity of Assoc. Prof. Dr. Dimitar Angelski prove that he exceeds the criteria for "Professor" according to the minimum scientific requirements. The total number of points on indicators gathered by the candidate is 1103, and the number of points required is 550 points, which is twice as much as required.

8. Conclusion

In connection with the above, I propose that the candidate Assoc. Prof. Dr. Dimitar Hristov Angelski be elected "Professor" in the discipline "Furniture Technology" from Professional Field 6.5 Forestry, scientific specialty "Technology, mechanization and automation of woodworking and furniture industry ".

Prepared the opinion:


/prof. Dr. Slavcho Sokolovski/

The opinion was transmitted on: 08.04.2022 г.