

EVALUATION STATEMENT

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on the materials submitted for participation in a competition for the occupation of the academic position “Associate Professor” in Plovdiv University “Paisii Hilendarski” in the Higher education area 5. Technical sciences; the Professional field 5.1 Mechanical engineering, Scientific specialty “Mechanical Engineering Technology”

The single candidate in this competition, proclaimed in Bulgarian ”State Gazette”, Issue 57 of 26.06.2020 and at the site of Plovdiv University “Paisii Hilendarski” (PU) for the needs of the department of Mechanical Engineering and Transport to the faculty of Physico-technological faculty, is Chief Assistant Professor Eng. Velko Slavchev Rupetsov PhD from the same department. The evaluation was completed on the base of documents and publications, presented by the candidate.

1. General overview of the procedure and the candidate

According to the order № P33-4124 from 24.08.2020 of the Rector of Plovdiv University (PU) I was appointed as a member of the scientific jury in the frame of the competition for the academic position “Associate Professor” in PU in the higher education area 5. Technical sciences; the Professional field 5.1 Mechanical engineering; the Scientific specialty of Mechanical Engineering Technology. Chief Assistant Professor Eng. Velko Slavchev Rupetsov PhD from PU is the single candidate submitted his documents for participation in the announced competition.

The competition materials in electronic format were provided to me as a link to drive.google.com. The candidate dr Rupetsov submitted 27 scientific works, one monograph, one book, one textbook, three training manuals, a list of his participations in four universities’ and a national research projects. All presented scientific works are accepted for reviewing as they are in the field of this competition and they are not a part of his PhD thesis. The book (that is not provided) written on the base of PhD thesis should not be reviewed in the framework of this competition. The scientific works can be classified by the following headings: 18 works (or 67 %) were presented in Bulgaria, 5 works – in abroad and 4 scientific works were published in international journals and scientific collections as the latter were referred in international recognized databases. There are confirmation records for four introduced his developments in Bulgaria. The total work experience of Mr. Rupetsov is of over 31 years as his research and educational experience is 30 years. He obtained PhD degree in the professional field five years ago.

Personal impressions: I met the candidate in the frame of a doctoral course that I lead. My impressions are excellent for a colleague who works systematically and balanced in his assessments.

2. General characteristics of the activities of applicant

Educational and pedagogical expertise and activities. According to the information submitted, the applicant has lectured six bachelor courses and two magister courses. He conducted laboratory and seminar exercises for 13 disciplines mainly for bachelors. In this regard he is co-author of a textbook and a guide for exercises in the field of scientific specialty and two other training manuals. All these books have ISBN numbers. Chief Assistant Professor Rupetsov composed 24 course syllabus for bachelor courses and four ones for master courses. He took part in the development and upgrading of curriculums and the documentation preparation for programial accreditation. The candidate Rupetsov supervised 32 students who prepared the diploma projects in the period of 1995-2019. As an additional result of these projects, four scientific works with students as co-authors were issued. Dr. Rupetsov acted as an Academic Mentor in an EU project “Student Internships”. He took part in EU program Erasmus+ for lecturers’ mobility as well.

Research, scientific-applied and implementation activities. The scientific production, submitted for the competition, includes six articles (or 22 %), published in scientific journals, and 21 reports, published in the collections of scientific events. The scientific works, written in Bulgarian, are ten, and in foreign languages – 17 (or 63 %). Sixteen works were written in English and a publication – in Russian. Dr. Rupetsov is the single author in four scientific works. He is the first and the second author in 8 and 6 of the presented works, respectively. All this testifies to the personal contribution of the candidate in the scientific production presented. Seven (or 26 %) of the scientific works were referred in international recognized databases Scopus and WoS for scientific information. The applicant has one publication in a journal with IF₂₀₁₆ 0.238, the second publication - in a journal with SJR 0.212 and a report published in scientific collections with SJR 0.192. Dr. Rupetsov listed 21 citations of his scientific works in his NACID info-form filled, as two of them are in the journals with IF. Thirteen of these citations were provided in his provided info pack. All this demonstrate the international visibility and fruitfulness of the candidate's scientific production.

The monograph, presented as a work for habilitation, has a volume of 128 pages and a reference list comprised 148 sources as 115 of which are in Latin. Two distinguished experts in the scientific specialty reviewed this book. A separate list of candidate's scientific works, on the basis of which a monograph was developed, is not given. In the section 4.8 (page 113) 11 researches of the applicant were pointed. Unfortunately, there are some discrepancies in the numbering of some of these 11 publications and the list of references. In the latter 14 scientific works of the applicant can be found as 11 of them were written in English. However, of these 14 works should be removed: #26, represented PhD thesis of the applicant (It is accounted in the section A of NACID info-form); #27, represented a book written on the base of PhD thesis (It is accounted in the section Г.6 of the same info-form). So, there are 12 works left, that may be considered sufficient as a basis of a habilitation work. In this case, I fully trust to the two esteemed reviewers - narrow experts working in the same problem. I do hope that they revealed original scientific achievements sufficient in volume and significance in their positive reviews. In this way the presented book meets the basic requirements for a monograph.

Dr. Rupetsov participated in four university's research projects, three of which were funded by PU-Plovdiv and one - by UFT-Plovdiv. He took part in 10 scientific forums in abroad, as well as in eight other international scientific forums held in Bulgaria. The joint work with Arexim Engineering EAD, Smolyan and the study of wear-resistant coatings on tool equipment are also of interest and they should be congratulated.

Scientific and applied activities of dr. Rupetsov are broad and cover many aspects of the scientific specialty Mechanical Engineering Technology. The applicant formulated correctly his contributions as scientific-applied and applied ones. Dr. Rupetsov summarized quite correctly his scientific works with the most significant scientific and applied contributions in his monograph. The objective of this monograph is the developments and research directed to increasing the resource of tools and details by applying hard, wear-resistant nanocoatings. There are developed technologies for depositing hard nanolaminate coating Ti/TiN/TiCrCN/(CrCN/TiCN)_n [7], Ti/TiN/AlTiSiN/(AlTiSiN/TiAlSiN)_n/AlTiSiN [6], multicomponent coatings TiCrAlN and CrTiAlN [4], multilayer CrN/TiN coatings [3]. A part of these coatings were characterized as innovative. It would be more convincing, if this statement was supported by patents protected or by articles published in scientific journals with a higher IF (IF > 1).

For the coatings thus obtained, a wide range of physico-mechanical and tribological studies were completed. These studies were directed to (i) for selecting more relevant technological factors [3,4] for depositing these coatings and (ii) for measuring the functional characteristics of the coatings [1,2,6,7,18,20,21,22,27]. From the group of engineering and applied contributions I would like to emphasize (i) the outlined areas of the most effective applications of the developed hard nanocoatings [2,27; the annex in pp 114-115 from the monograph]; (ii) assembling devices [19, 24] for

deposing coatings and measuring their thickness. As an engineer worked in the industry, I also appreciate the engineering-applied contributions aimed at solving more traditional engineering problems [5, 8, 9, 10, 11, 14, 16, 17, 25, 26] in the field of Mechanical Engineering Technology.

Assessing the personal contribution of candidate. The interdisciplinarity of the developed technologies and the related various researches determined the large work teams, organizations and companies that were involved in these activities. For that it is quite difficult to make a sharp distinction in the personal contribution of each of the co-authors. Undoubtedly, the candidate took an active part in all physical, mechanical and tribological studies of the developed coatings and the evaluation of their industrial applications. In the rest of the researches and scientific works, that are closely related to Mechanical engineering technology, the applicant's personal contributions are undisputed and significant.

3. Critical remarks and recommendations

It ought the NACID info-form to be filled more correctly, in order to some undesirable technical duplications of some scientific works in distinct sections to be avoided. For example, the scientific works pointed in the sections Г.7-4; Г.7-2; Г.7-19; Г.7-7; Г.7-21; Г.7-6; Г.7-24; Г.8-22 in NACID info-form duplicate in practice the scientific works of the candidate with numbers #53, # 60, # 99, # 113, # 114, # 115, # 116, # 118 in the references of monograph. The monograph itself (developed on the basis of the above-pointed eight works and four other publications of the applicant) is accounted in the section B of NACID info-form. Besides, the work #5 in the section Г.7 is with five co-authors or $n = 5$. Thereupon the scores should be corrected from 10 to 8 ($= 40/n$).

Conclusion

The documents and materials, submitted by the candidate Dr. Velko Rupetsov, meet the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria, Regulations on the Implementation of the Development of Academic Staff in the Republic of Bulgaria Act and the relevant Regulations of PU.

The candidate in the competition submitted a significant number of scientific works published outside the materials used in the defense of PhD degree. In these works of the candidate there are original scientific and applied contributions, which were aprobated in many national and international scientific events. His experimental and theoretical researches were provoked by some problems in industrial practice and they aim for solving these problems. Some of his developments were directed and they were introduced in his educational practice. The scientific and teaching qualification of Chief Assistant Professor Velko Rupetsov PhD is undoubted and respectful.

After getting acquainted with the materials and scientific works submitted in the competition, the assessment of their significance and the scientific-applied and engineering-applied contributions contained in them, I find for reasonable to give my positive assessment and to suggest the Scientific Jury to prepare a report- proffer to the Faculty Council of the Faculty of Physics and Technology for the election of Chief Assistant Professor Velko Rupetsov PhD to the academic position of 'Associate Professor' in PU "Paisii Hilendarski" in the higher education area 5. Technical sciences; the Professional field 5.1 Mechanical engineering and the scientific specialty "Mechanical Engineering Technology".

October 18th, 2020, Plovdiv

Member of scientific jury:

(Prof. Stepan Garo Akerian DSc)