

REVIEW

to occupy the academic position:

“Professor”	
“Associate Professor”	X
	one of the academic positions indicated shall be marked with the sign “X”

Candidates to occupy the position:

1	Assist. Prof.	PhD	Kalin	Simeonov	Krumov	UCTM – Sofia
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5.	Technical Sciences
code	name

Professional area:

5.4.	Energetics
code	name

Scientific specialty:

Industrial Thermal Engineering

The competition has been announced:

67	04.08.2023	“Technology of Silicates”	of Metallurgy and Materials Science
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

Professor	PhD	Rayko	Danailov	Stanev	UCTM
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

Assist. Prof.	PhD	Kalin	Simeonov	Krumov
academic position	scientific degree	name	middle name	last name

1.1. Completion of the provided documents:

A) The competition documents are in full compliance with the Regulations	3 points	X
B) The documents are complete but do not fully comply with the requirements of the Regulations	2 points	

C) The documents are not completed in accordance with the requirements of the Regulations	0 points	
		one of the answers given is marked with the sign "X"

Missing documents and violated requirements must be described if response C is marked.

1.2. Meeting the minimum requirements under the Regulations:

A) The candidate meets the minimum requirements	20 points	X
B) The candidate doesn't meet the minimum requirements	0 points	
		one of the answers given is marked with the sign "X"

It must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.

The candidate participates in the competition with a sufficient number of publications from the individual categories, some of which are in refereed and indexed in world-renowned databases of scientific information specialized editions, and the rest – in peer-reviewed journals or edited collective volumes, as well as with papers presented at international or national conferences, and other forums. The presented scientific works and their response in the thermal engineering circles in the form of citations by other authors, meet and some of them exceed the minimum requirements according to the Law for the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Implementation and the Regulations for Acquisition of Scientific Degrees and Holding of Academic Positions at UCTM.

1.3. Relevance of scientific and / or applied research:

A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors)	7 points	
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	5 points	X
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	3 points	
D) The smaller part of the research is relevant	2 points	
E) Research is not relevant	0 points	
		one of the answers given is marked with the sign "X"

The evaluation of the relevance of the research must be substantiated.

The scientific production of the candidate is focused on the following main thematic areas:

- investigation of multiphysical processes and the efficiency of industrial furnaces, dryers and equipment, which are concretized in the mathematical description of the conjugate heat transfer in high-temperature chamber gas furnaces for ceramic firing, in study of the transport and mechanical processes in convective drying of ceramics and of the heat transfer in thermal probe for temperature measurement in bulk layer, and also in the operating modes ensuring a high level of efficiency of photovoltaic systems;
- clarifying problems of heat exchange, heat load and passive utilization of solar energy in modern transparent building envelopes;
- investigation of environmentally friendly solid rocket fuels and biodegradable composites for the for aircraft products.

Assist. Prof. Krumov PhD has enriched and further developed the available information on the above-mentioned relevant areas with his own contributions described in the presented publications.

1.4. Knowledge of the problems subject of research:

A) The candidate knows in detail the achievements of other authors on the researched topics and/or applications	6 points	X
B) The candidate is partially familiar with the achieved results on the researched topics and / or applications	4 points	
C) The candidate has no prior knowledge of the status of the researched problems	0 points	
		one of the answers given is marked with the sign "X"

The evaluation must be substantiated if answer C is marked.

1.5. Type of research:

A) Theoretical	4 points	
B) Applied	4 points	
C) Theoretical with application elements	4 points	X
D) It does not correspond to the level specified in the Act for the Development of the Academic Staff in the Republic of Bulgaria and the Regulations	0 points	
		one of the answers given is marked with the sign "X"

The level of research must be substantiated if answer D is marked.

1.6. Objectives of the research:

A) Realistic and of scientific and / or applied interest	8 points	X
B) Realistic, but not of scientific and / or applied interest	4 points	
C) Unattainable (unrealistic)	0 points	
		one of the answers given is marked with the sign "X"

Objectives must be specified. The type of the set objectives must be justified.

The diverse research activity of Assist. Prof. Krumov PhD does not allow an unambiguous and concise systematization of the set objectives. However, it can be summarized that they are oriented towards the deepening of the modern knowledge of the complex transport processes occurring in heat engineering units used in the silicate industry, in particular in high-temperature chamber gas furnaces for ceramic firing and in drying installations, and also in buildings with different variants of glazing of their facades. Other highlights of the candidate's work include optimizing the operation of photovoltaic systems and replacing harmful solid rocket fuels with environmentally friendly energy carriers.

1.7. Methods of research:

A) Adequate to research and set scientific objectives and /or applications	8 points	X
B) Partially appropriate, enabling part of the scientific objectives and / or applications to be achieved	4 points	
C) Inappropriate methods	0 points	
		one of the answers given is marked with the sign "X"

Methods must be specified. The type of methods used is justified.

The methods used in the research of Assist. Prof. Krumov PhD consist in a critical analysis of the available information and selection of problems that are essential from the theoretical and practical point of view, setting of realistic goals and objectives based on these problems, a thorough study of the current level of knowledge in the relevant field, and combining experimental studies and mathematical modeling of the ongoing transfer processes. The developments end with the formulation of conclusions adequate to the achieved results with a markedly practical orientation.

1.8. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the	20 points	
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basis for new research and applications		
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	X
C) They are of scientific and / or applied interest	12 points	
D) Lack of significant contributions	8 points	
E) Lack of contributions	0 points	
		one of the answers given is marked with the sign "X"

Contributions must be specified. The type of results achieved must be justified.
<p>The candidate has not applied a systematization of the contributions in his works, which makes it difficult to summarize them on the basis of the publications submitted for the competition. However, a deeper reading of his works allows to conclude that most of the contributions are of a scientific-applied and applied nature. Among them, the creation and validation of mathematical models and algorithms for numerical investigation of the interrelated heat, mass and momentum transport phenomena in the investigated aggregates from the silicate industry are noteworthy. On the basis of them, optimal operating modes can be determined without the need for unwanted intervention in the technological processes and the associated risks of disrupting the production rhythm, which are typical for conducting physical experiments in real functioning industrial facilities.</p>

1.9. Participation of the candidate in the achievement of the presented results:

A) The candidate has at least an equal participation in the submitted papers	8 points	
B) The candidate has at least an equal participation in most of the submitted papers	7 points	X
C) The candidate has a secondary participation in most of the submitted papers	4 points	
D) The candidate participation is unnoticeable	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items C or D is marked.
<p>In 2 out of the proposed 10 publications as a habilitation thesis, Assist. Prof. Krumov PhD is the first author, in 3 his name is on the second place, in 2 – on the third, and in the remaining 3 he is listed under number four.</p> <p>The same equilibrium with regard to the remaining scientific works that are not presented as habilitation thesis allows to notice that in 6 the candidate's name is in the first position, and in 20 – in the second position. A good impression is made by the fact that in relation to the 4 works out of the mentioned 26, which are in refereed and indexed in world-known databases with scientific information specialized issues, Assist. Prof. Krumov PhD is the lead author in half of them, and in the others he is listed in second place. Moreover, he is in the first position in the presented</p>

textbook.

From the scores forming the sum of indicators B and Г (according to the Bulgarian text of the mentioned Regulations), as well as from the absence of attached protocols for other ratio in the distribution of the contributions of the individual members of the scientific research teams, it can be concluded that the participation of the candidate is equivalent to that of his co-authors in most of the submitted papers.

1.10. Pedagogical activity:

A) The candidate has effective and sufficient pedagogical activity at the university. The textbooks issued are modern and useful (they meet the requirements of the Regulations). The work with undergraduate and doctoral students is at a high professional level.	8 points	X
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	
C) The pedagogical activity and / or textbooks issued are insufficient (do not meet the requirements of the Regulations)	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items B or C is marked.

According to the submitted list, in the last 3 academic years, Assist. Prof. Krumov PhD has led and continues to lead lectures on 8 different disciplines related to his scientific and professional interests and competence, the majority of which are those for the educational and qualification degree "Master". In one of them the teaching is in English.

1.11. Critical notes:

A) Lack of critical notes	8 points	X
B) Critical notes of a technical nature	7 points	
C) Critical notes that would partially improve the results achieved in a small part of the research	5 points	
D) Critical notes that would partially improve the results achieved in most of the research	3 points	
E) Significant critical notes	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the answers C, D or E is marked.

The acquiring of a more complete picture of the versatile and fruitful research activity of the candidate would be assisted if at the end of the attached document "Summaries of the main results and scientific

contributions of Assist. Prof. Eng. Kalin Simeonov Krumov PhD”, a clear systematization of the contributions distributed by individual categories was made, even at the cost of some repetition of the already presented text.

1.12. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	This evaluation is assigned to a total number of at least 65 points	X (93 points)
B) The evaluation of the candidate's activity is NEGATIVE	This evaluation is assigned to a total number below 65 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the reviewer

The fulfillment of the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Implementation and the Regulations for Acquisition of Scientific Degrees and Holding of Academic Positions at UCTM for obtaining the academic position of "Associate Professor", as well as their exceedance in some of the indicators, and also my personal impressions from the work of Assist. Prof. Krumov PhD at the Faculty of Metallurgy and Materials Science and the University, convince me of his qualification and authority as a scientist and lecturer. All the documents submitted for the competition are structured and presented at a good technical level, and the texts are prepared precisely and clearly.

Apart from the obligatory criteria in the individual points of the review, some other activities of the colleague deserve mention. Among them are 38 participations in national and international conferences, 5 defended diploma theses under his supervision, participation in 6 national and international projects, and also in 6 scientific research projects funded through the Scientific Research Sector at UCTM as their head, a development of 13 curricula, as well as his acquisition of a total of 25 letters, diplomas and certificates as a result of his versatile activities so far.

These circumstances give me grounds to state once again in conclusion that the candidacy satisfies the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Implementation and the Regulations for Acquisition of Scientific Degrees and Holding of Academic Positions at UCTM for awarding the academic position "Associate Professor", which argues my already marked positive assessment of the activity of Assist. Prof. Eng. Kalin Krumov PhD, as well as my recommendation to the other members of the respected scientific jury to support his successful performance in the current competition.

21.11.2023	The review was written by:	
date		signature