

REPORT

to occupy the academic position:

"Professor"	x
"Associate Professor"	
	one of the academic positions indicated shall be marked with the sign "X"

Candidates to occupy the position:

1	Assoc. Prof.	PhD	Dimitar	Markov	Krastev	UCTM – Sofia
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5.	Technical Sciences
code	name

Professional area:

5.9.	Metallurgy
code	name

Scientific specialty:

Metal Science and Heat Treatment of Metals
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The competition has been announced:

102	23.12.2022	“Physical Metallurgy and Thermal Equipment”	of Metallurgy and Materials Science
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

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

1. Report for the candidate:

Assoc. Prof.	PhD	Dimitar	Markov	Krastev
academic position	scientific degree	name	middle name	last name

1.1. 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 Assoc. Prof. Eng. Dimitar Krastev PhD presents a sufficient number of publications in refereed and indexed specialized editions, as well as in international and national conferences and other forums, enabling wide coverage by scientists and experts from the interested branches. These papers, as well as their citations, by their quantity and number of corresponding points, meet and according to some of the criteria, they exceed significantly the minimum requirements in compliance with the Regulations for Acquiring Scientific Degrees and Holding Academic Positions at UCTM.

1.2. 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)	8 points	x
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	4 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 candidate demonstrates erudition of various thematic areas of the metal science and the heat treatment of metals. Some of the results achieved by him are confirmatory and complementary to the level of modern knowledge in the relevant field, but there are also developments containing data on new processes. Such are, for example, research related to the surface modification of steels, the accumulation of data on new processes of obtaining carbides and reduction of oxides in the conditions of an electrothermal rotating bed, the development of heat treatment regimes of high chromium wear-resistant white cast irons to achieve certain of their characteristics, obtaining new data on the influence of nanodispersed impurities on the structure of tool steel, etc. The correct presentation and right interpretation of these results increase the relevance of the scientific and applied research of Assoc. Prof. Krastev.

1.3. 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 candidate's research activity concentrates on setting and successfully achieving the following scientific and applied goals:

- Proving the possibility of using the:
 - electric spark treatment in electrolyte as a method for surface modification of steels;
 - electrothermal rotating layer for the production of nitrides, carbides and carbonitrides, and for the reduction of metal oxides;
 - electrospark processing to obtain a modified nanostructured layer with high microhardness, reaching 16000 MPa, on the surface of high-speed steel.
- Receiving data on the:
 - influence of electrolytes with different compositions on the characteristics of the modified layers on the surface of tool steels;
 - structure of high chrome wear-resistant white cast irons in different states;
 - wear resistance of high-chrome white cast irons with an increased level of this indicator in different states of the structure and ways of their thermal treatment;
 - influence of different types of chemical-thermal treatment and surface modification on the structure and properties of steels.
- Examination of:
 - new processes for obtaining carbides and reduction of oxides in the conditions of an electrothermal rotating bed;
 - the reasons for the defects of details during their operation and offering solutions to eliminate the arising problems;
 - increasing the corrosion resistance of steels through their surface modification.
- Description of the impact of electrical discharges during electrospark processing of steels in electrolyte on the topography of the treated surface.
- Development of thermal processing regimes of the materials mentioned in the previous point to obtain certain of their characteristics.

1.4. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	
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.

The most significant scientific contributions of the candidate's developments can be indicated as the:

- study of innovative methods for obtaining carbides and reduction of oxides in the conditions of an electrothermal rotating bed;
- establishment of the influence of different types of chemical-thermal treatment and surface modification on the structure and properties of steels.

Among the scientific-applied and applied contributions for which Assoc. Prof. Krastev has reason to claim, deserve special attention:

- proving the possibility of use the:
 - electric spark treatment in electrolyte as a method for surface modification of steels;

- electrothermal rotating bed for the production of nitrides, carbides and carbonitrides, and also for the reduction of metal oxides;
- the creation of heat treatment regimes of high-chromium wear-resistant white cast irons in order to obtain certain of their characteristics;
- the identification of the factors leading to the failure of details during their operation, as well as the proposal of specific solutions to overcome the emerging problems;
- the research on increasing the corrosion resistance of steels through their surface modification.

1.5. 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	X
B) The candidate has at least an equal participation in most of the submitted papers	7 points	
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.

The list of publications of Assoc. Prof. Krastev, submitted for participation in the competition, contains 52 items, distributed as follows: 1 monograph, 12 articles in editions, refereed and indexed in world-famous databases with scientific information, 35 publications printed in non-refereed journals with review or in edited volumes, 1 chapter in a collective monograph, 1 university textbook, 1 patent and 1 utility model. Of these, 3 publications are self-dependent, in 23 the candidate's name is in the first place, in 20 – in the second position, in 4 – in the third and in 2 – in the fourth one. Therefore, in 50% of all works he is the lead or sole author, which is also true for these in refereed and indexed editions, and in others over 38% his name is in second place.

The indicated data give reason to categorically assume that Assoc. Prof. Krastev has a first-rate participation in the development of the presented scientific publications and in their contributions.

1.6 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.

1.7. Critical notes:

A) Lack of critical notes	8 points	
B) Critical notes of a technical nature	7 points	X
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.

1.8. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	This evaluation is assigned to a total number of at least 50 points	X (75 points)
B) The evaluation of the candidate's activity is NEGATIVE	This evaluation is assigned to a total number below 50 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the member of the scientific jury

The good layout of the submitted documents for participation in the competition, the already emphasized satisfaction of the requirements of the Regulations for Acquiring of Scientific Degrees and Taking of Academic Positions at UCTM for occupation of the academic position "Professor" and the significant excess of some of them, as well as my personal impressions from the long-term work of the candidate at UCTM, show his high qualification and authority as a scientist and lecturer. A few more facts from his varied activities deserve to be mentioned. The scientific projects of which Assoc. Prof. Krastev was the manager have a total value of over BGN 78000. In addition, he is a vigorous participant in international research and educational programs. He prepared 12 reviews of scientific works and developments.

The listed circumstances lead to the conclusion that the candidature satisfies the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for Acquiring of Scientific Degrees and Taking of Academic Positions at UCTM for awarding of the academic position "Professor". This substantiates my already marked positive assessment of Assoc. Prof. Krastev's work, as

well as my recommendation to the other members of the respected scientific jury to support his successful performance in the current competition.

21.04.2023	The report was written by:	
date		signature