S T A T E M E N T

of Prof. DSc Maria Plamenova Nikolova

University of Ruse “Angel Kanchev”

to occupy an academic position "Associate professor"

in the field of higher education 5. Technical Sciences,

Professional direction 5.6 Materials and Materials Science,

scientific speciality – "Materials science and technology of engineering materials"

In the competition for “Associate Professor”, announced in the State Gazette, No. 53 of 09.06.2026, for the needs of the Department of “Materials Science and Mechanics of Materials” (MMM) at the Faculty of Mechanical Engineering and Instrumentation, Ch. Assist. Prof. Dr. Eng. Milka Grigorova Atanasova participates as a candidate.

1. **Brief biographical data**

Ch. Assist. Prof. Dr. Eng. Milka Grigorova Atanasova graduated from TU-Gabrovo in 2000 (Master’s degree in “Machine-Building Equipment and Technologies”) and has worked there continuously since March 2001 – as assistant, senior assistant and chief assistant professor in the departments of “Materials Science and Technology of Materials” (2001–2012), “Machine-Building Equipment and Technologies” (2012–2020) and, since 2020, “Materials Science and Mechanics of Materials” (MMM). In 2016 she defended a dissertation on “Technology for finishing of holes implementing the method ‘Spherical mandrelling’” and obtained the educational and scientific degree “Doctor” in the scientific specialty “Mechanical Engineering Technology” (diploma No. 0052/26.05.2016). The habilitation work (electron-beam processing) is a new direction relative to the dissertation (plastic deformation).

2. **General description of the presented materials**

The candidate has submitted the documents required by the Law on the Development of the Academic Staff in the Republic of Bulgaria, its Implementation Rules and the Rules of TU-Gabrovo. According to the scientometric tables (Appendices 2.4 and 2.5), she accumulates 50 points in group A, 183.76 in group B (habilitation work), 211.5 in group Г (16 under indicator 7 and 195.5 under indicator 8) and 250 in group Д (citations); group E is not filled in Table 1, although she has participated in projects and has two published textbooks. She participates in the competition with:

- a habilitation work of 10 publications (В.4.1–В.4.10) from 2022–2026, referenced and indexed in Scopus: 1 in Q1, 3 in Q2, 3 in Q3, 1 in Q4 and 2 in a proceedings volume without a quartile; four are in journals with an impact factor (Metals – 2, Crystals, Journal of Manufacturing and Materials Processing). It is accompanied by an Extended habilitation reference of the contributions, equivalent to a monograph, on the topic “Applications of concentrated energy flows with continuous electron beam for surface hardening and welding of dissimilar materials”;
- 2 more publications referenced in Scopus (Г.7.1, Г.7.2) and 25 in non-referenced journals with peer review or in edited collective volumes (Г.8.1–Г.8.25) – a total of 37 publications, of which 5 are single-authored and 21 are from 2022–2026;
- 2 published textbooks: Amudzhev, I., M. Atanasova. Planning the layout of production. Gabrovo: Eks-press, 2019, 91 pp., ISBN 978-954-490-646-7, and Atanasova, M. Technologies

for producing blanks. Part I: Obtaining castings. Gabrovo: University Publishing House “Vasil Aprilov”, 2026, ISBN 978-954-683-745-5.

The six dissertation publications are listed separately and are not repeated among the materials submitted for the competition.

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

25 known citations in editions referenced in Scopus are presented, without self-citations. According to Scopus, the candidate has 26 citations and h-index = 3; there is no profile in Web of Science; according to Google Scholar – 55 citations and h-index = 4. Six publications are cited, but 22 of the citations refer to the collective works В.4.3 (8), В.4.4 (9) and Г.7.1 (5). The citing documents are from 2023–2026, and 18 of the 25 are in Q1 sources, which shows the international visibility of the results. The citations correspond to 250 points in group Д, which exceeds the minimum requirement.

4. General characteristics of the applicant's activity

4.1. Educational and pedagogical activity

Dr. Atanasova delivers lectures and laboratory classes in bachelor’s and master’s degrees in professional direction 5.6. Materials and Materials Science and in directions 5.1. Mechanical Engineering and 5.13. General Engineering. The courses cover blanks and casting, plastic deformation, stamping, welding, composite materials, and materials science and technology of mechanical engineering materials, i.e. they correspond directly to the speciality of the competition.

The textbook “Technologies for producing blanks. Part I” (2026) corresponds to the lecture course of the same name that the candidate delivers in the bachelor’s degree in 5.6.

For 2023–2026 the reference lists 21 entries of graduates under her supervision (one is repeated, i.e. 20 distinct theses), of which 5 are in the master’s programme “Surface Processing of Engineering Materials” (“Surface Engineering”). She is a group tutor of bachelor’s students, responsible for the master’s programmes “Materials Technology and Materials Science” (since 2019) and “Surface Processing of Engineering Materials” (since 2023), and takes part in the teams preparing the accreditation documents for professional direction 5.6.

It follows from the above that the candidate has a sufficient and successful pedagogical activity, including at master’s level, and a good organizational commitment to the educational process.

4.2. Scientific and scientifically applied activity

Ch. Assist. Prof. Dr. Eng. M. Atanasova is the author or co-author of 37 publications submitted for the competition; 21 of them are from 2022–2026, which shows a substantial intensification of her scientific activity. The total impact factor of the four publications in journals with an impact factor is 12.4. The habilitation publications are united by a common concept – control of structure formation when processing metals with a continuous electron beam. They address electron-beam welding (EBW) of dissimilar materials (Cu/AISI 304L, Ti6Al4V/Al6082-T6, including with a magnetron-sputtered Cu interlayer, carbidic-bainitic cast iron CADI/AISI 316L and AISI 316L/additively manufactured Maraging 300 steel) and electron-beam surface hardening (EBSH) of cylindrical specimens of C45 steel. The relationships “technological regime – structure and phase composition – mechanical characteristics and surface integrity” have been established with a set of modern methods (XRD, SEM, EDS, microhardness, residual stresses), which is a strength of the work.

The publications fall into six directions: electron-beam welding; processing with concentrated energy flows (EBSH, laser cladding and nitriding); carbidic-bainitic cast irons; hydrostatic and hydromechanical forming; bio-based additives for polymers; physico-metallurgical studies. The most topical direction is electron-beam processing, to which all habilitation

publications are devoted, while hydrostatic forming (Г.8.1–Г.8.12, 2002–2009) and bio-based additives are more peripheral.

The recent scientific research of Dr. M. Atanasova is up-to-date and of scientific and applied value – all ten habilitation publications are from 2022–2026; she has also published at forums such as UNITECH (Gabrovo), RaDMI (Serbia), AMTECH (Ruse), MEEST and ETR. There is a trend towards greater independence: four of her five single-authored publications (В.4.6, В.4.7, Г.8.20, Г.8.25) and her first-author ones (В.4.10, Г.8.24) are from 2024–2026.

She has been a member of the teams of 5 national projects (including КП-06-ПН47/6 on electron-beam welding, the Competence Centre "Intelligent Mechatronic, Eco- and Energy-Saving Systems and Technologies" and two projects with industrial partners – OSAM AD and Adtech Ltd), of 2 educational projects and of 16 university projects of TU-Gabrovo. She has completed 5 international mobilities. She has not led projects (Appendix 2.5).

She has also participated in modernizing the material and technical base of the department: she designed and manufactured a stand for hydrostatic forming, die tools and pattern equipment for complex castings, and maintains the hydraulic and eccentric presses in the plastic deformation laboratories.

I believe that Dr. M. Atanasova is a well-rounded specialist with long experience in both educational and research work.

4.3. Invention, inventions and other intellectual property products

No data are available on patents, utility models or other intellectual property products.

4.4. Contributions (scientific, applied science, applied)

The scientific-applied and applied contributions are listed in detail in the Author's reference for the contributions and in the Extended habilitation reference. The most significant of them are:

Scientific-applied:

• A new process for electron-beam surface hardening of cylindrical parts of C45 steel with linear scanning in the axial direction, which eliminates the thermal overlap effect; a gradient layer up to 0.2 mm and a threefold increase of microhardness (HV0.05 = 903) with compressive residual stresses [В.4.9, В.4.10, Г.8.21].

• EBW processes providing crack- and defect-free joints of dissimilar pairs: Cu/AISI 304L, CADI/AISI 316L, AISI 316L/Maraging 300 (additively manufactured) and Ti-6Al-4V/Al6082-T6 [В.4.1–В.4.8].

• Established relationships between beam power and positioning, oscillation, phase composition and mechanical properties of the welds, incl. the effect of a Cu interlayer (ultimate-to-yield strength ratio from 1.03 to 1.44) [В.4.1–В.4.8, Г.8.24, Г.8.25].

Applied:

• Optimal regimes for welding (no offset for Cu/AISI 304L; preheating to 340 °C and offset towards the steel for CADI/AISI 316L) and for hardening (scanning frequencies up to 20 000 Hz for lower roughness) [В.4.1–В.4.6, В.4.9, В.4.10].

• A technology for laser cladding and nitriding for restoring worn high-pressure casting dies of steel 1.2343, with 50% increased microhardness [Г.7.2].

• Experimental stands, modules and tools for plastic forming and stamping [Г.8.1, Г.8.2, Г.8.5, Г.8.7].

I accept the contributions indicated in the references. They are scientific-applied and applied in character; the most significant are the results on electron-beam welding of dissimilar materials and hardening of C45 steel, confirmed by publications in Q1–Q2 journals and international citations, and they are a basis for new directions in the field of "Technical Sciences".

5. Evaluation of the candidate's contribution.

The candidate has submitted 37 publications: 5 are single-authored, in 2 she is the first author, in 3 – second, in 19 – third, and in the remaining 8 – from fourth to ninth place. The author collectives are relatively constant within each direction. Since there are no distribution protocols,

it can be assumed that her participation in the co-authored works is at least equal. Her personal contribution is well expressed and has been growing in recent years.

6. Critical Notes

I address the following recommendations to the candidate, which in no way detract from what was written above:

- I recommend that the candidate strengthen her leading role in publications in higher-quartile journals. The Q1–Q2 articles of the habilitation work (B.4.3, B.4.4, B.4.8, B.4.9) are collective works of 7–10 authors, in which she is in third to eighth place, while her single-authored and first-author works (B.4.6, B.4.7, B.4.10) are in proceedings without a quartile or in a Q3 journal.
- I recommend more active participation in research projects as a project leader – at present she participates only as a team member.
- It would be good to focus and deepen in a specific direction: the six directions include some that are far from the main one (bio-based plasticizers for PVC, hydrostatic forming – Г.8.1–Г.8.12, 2002–2009), and most university projects (surface plastic deformation, diamond burnishing, fatigue) are not reflected in the publications submitted for the competition. Consolidation around electron-beam processing and surface engineering would correspond to the master's programme "Surface Processing of Engineering Materials" for which she is responsible.
- Some technical inaccuracies in the reference documents, which do not affect the assessment, should be corrected: duplicated entries (project M916; a graduate's thesis in both periods); publications from 2002–2009 in the summaries "after the defence of the doctoral dissertation"; Г.8.19 instead of Г.8.18 under the bio-based additives in the same summaries; a different basis for the 50% microhardness increase in Г.7.2 (the base material in the author's reference, the pre-nitriding state in the summaries).

7. Personal impressions

I do not know Dr. M. Atanasova personally. From the materials for the competition I judge that she is a dedicated teacher with more than 25 years of experience at TU-Gabrovo, an active participant in research teams and in the organization of the educational process, and a colleague who knows how to work in a team. The published textbooks and the stands and tools she designed and manufactured testify to her applied skills.

8. Conclusion

Bearing in mind the above, I propose Ch. Assist. Prof. Dr. Eng. Milka Grigorova Atanasova to be elected as "Associate Professor" in the field of higher education 5. Technical Sciences, professional direction 5.6. Materials and Materials Science, speciality "Materials Science and Technology of Mechanical Engineering Materials".

17.10.2026
Ruse

Jury member:
/Prof. DSc Maria Nikolova/