

R E V I E W

By:

**Prof. Dr. Eng. Krasimir Todorov Krastanov VTU “Todor
Kableshev”**

**for the competition for occupying the academic position
“Associate Professor” in the field of higher education 5. Technical
Sciences, professional field 5.8 “Prospecting, Extraction and Processing
of Mineral Resources”, scientific specialty “Open-pit and Underwater
Mining of Mineral Resources”, announced by the University of Mining
and Geology “St. Ivan Rilski” in the State Gazette, issue 36 of 17.04.2026,
with candidate Chief Assistant Dr. Eng. Martin Ivanov Pushkarov.**

Grounds for submitting the review:

**Participation in the Scientific Jury, approved according to Order
No. RD13-22/18.05.2026 of the Rector of the University of Mining and
Geology “St. Ivan Rilski”.**

1. Creative Biography

Between 2011 and 2017, the candidate obtained a Bachelor's and Master's degree in "Hydraulic and Pneumatic Engineering" at the Technical University of Sofia. Between 2017 and 2020, he completed a Master's degree at the University of Mining and Geology "St. Ivan Rilski" in the specialty "Open-pit Mining". He earned a PhD in "Fluid Mechanics" in 2020.

Since June 2025, he has held the position of Chief Assistant at the University of Mining and Geology "St. Ivan Rilski", where he develops active teaching and research activities. Prior to that, between November 2024 and June 2025, he was an Assistant at the same university.

Between 2021 and 2024, he worked as a Chief Assistant at the Technical College – Sofia, part of the Technical University – Sofia. Parallel to his academic work, he has accumulated significant practical experience in industry. Between 2020 and 2022, he was an investment project manager at "Minproekt" EAD, and before that he consecutively held positions as mechanical engineer, design engineer, and head of the "Mechanical–Technological and Design" department.

His professional experience includes designing mechanical and technological systems, developing equipment for the mining and food industries, as well as managing engineering and investment projects.

2. General Description of the Submitted Materials

The candidate has submitted a complete and well-structured set of documents attesting to his academic qualifications, professional experience, and scientific output. The documentation includes: the official announcement of the competition, diplomas for the acquired educational and scientific degrees, a curriculum vitae, certificates verifying professional experience and teaching workload, a monograph, scientific articles, lists of publications and conference papers, as well as citation reports from national and international databases. The submitted materials are comprehensive and fully comply with the requirements for participation in a competition for the academic position of Associate Professor.

3. Characteristics of the Research and Applied Scientific Activity

The research activity of Chief Assistant Dr. Eng. Martin Pushkarov spans a broad range of engineering fields within the domain of technical sciences. His main thematic areas include hydraulic and pneumatic systems, turbomachinery modelling, hydrodynamic processes, analysis and treatment of mine waters, experimental investigations of air and water flows, as well as developments in energy technologies and bioenergy.

Particularly relevant to the profile of the competition is his research on mine waters. The monograph dedicated to numerical modelling and experimental analysis of contamination resulting from mining operations examines the topic within a wide engineering-applied context, encompassing safety, slope and underground excavation stability, drainage processes, and the long-term stability of disturbed terrains. The scientific output demonstrates consistency, thematic development, and meaningful contributions to engineering science.

4. Publication Activity

The candidate participates in the competition with a total of 27 scientific publications, including one monograph, 21 articles in refereed journals, and 6 articles in non-refereed editions. The submitted materials meet and exceed the minimum national requirements for habilitation. Under indicator G, the candidate presents 21 publications in refereed and indexed journals, amounting to 228.38 points. The total number of points across all indicators is 463.68, compared to the required minimum of 400, clearly demonstrating compliance with the regulatory criteria.

5. Teaching Activity

The report provided by the Faculty of Mining Technology confirms a stable annual teaching workload of approximately 400 hours. The candidate delivers lectures and practical classes in disciplines related to mineral extraction, mining technologies, mining software, best mining practices, surface mining complexes, and technical reclamation. The scope of the taught subjects is broad and corresponds to the profile of the programmes offered at the University of Mining and Geology "St. Ivan Rilski". The workload is consistent and ensures long-term compliance with the normative requirements for teaching activity.

6. Scientific and Applied Contributions

The submitted works contain significant scientific and applied results, which may be grouped into the following thematic areas:

I. Hydrokinetic Turbines and Utilization of Energy from Water Flows

The candidate has developed models, simulations, and experimental analyses of hydrokinetic turbines aimed at harnessing the energy of flowing waters and ocean waves. The results contribute to the advancement of renewable energy technologies.

II. Hydraulic Systems, Measurement, and Diagnostics

The research includes the development of new engineering solutions for testing and diagnosing hydraulic components, as well as the creation of specialized measuring devices and test stands. The obtained results have substantial applied scientific value.

III. Environmental Technologies and Sustainable Development

The publications address the use of biochar and hydrochar for improving soil fertility, analyses of air quality and emissions from construction materials, and the application of sustainability principles in engineering practice.

IV. Engineering Design, Laboratory Systems, and Digital Technologies

The candidate has developed laboratory stands, measuring systems, and specialized equipment employing modern CAD/CAE technologies, three-dimensional modelling, and engineering simulations. These results contribute to the optimization of engineering processes.

V. Mining Engineering, Mathematical Modelling, and Intelligent Technologies

The research encompasses optimization of technological processes in surface mining, modelling of crushing-transport complexes, diagnostics of mobile machinery, and the implementation of digital technologies to enhance efficiency and safety in mining operations.

7. Citations

The candidate presents 8 citations from journals indexed in Scopus and Web of Science. The total number of independent citations in Scopus is 25, and the Hirsch index is $h = 3$. Several of the citing journals are ranked in Q1 and Q2, indicating international visibility and recognition of the scientific contributions.

8. Critical Remarks and Recommendations

The research activity is evaluated positively; however, a need for clearer thematic focus is evident. The broad scope of topics is an advantage but may lead to fragmentation of research directions. It is recommended that the candidate consolidate his scientific profile around key areas such as surface mining, mine waters, and digital technologies in mining engineering.

It is further recommended that practical experience be more actively integrated into the teaching process through the involvement of students and doctoral candidates in experimental work and project-based tasks, which would support the development of sustainable engineering competencies.

9. Conclusion

After analysing the submitted materials, scientific output, teaching activity, and professional experience of Chief Assistant Dr. Eng. Martin Ivanov Pushkarov, I conclude that the candidate meets the requirements of the Law on the Development of the Academic Staff, its implementing regulations, and the internal rules of the University of Mining and Geology "St. Ivan Rilski". On this basis, I express a positive opinion and recommend that the candidate be appointed to the academic position of Associate Professor in professional field 5.8 "Prospecting, Extraction and Processing of Mineral Resources".

13.08.2026

Prof. Dr. Eng. K. Krastanov