# S T A N D P O I N T

for participation in a competition for an academic position "Associate professor" in
**Professional field**: 5.1 Mechanical engineering
**Scientific specialty:** Cutting of the materials and cutting tools
**Posted at DV:** Issue 40/31.05.2022
**Applicant:** Ch. Assistant Dimka Kostadinova Vasileva, PhD, Eng.
**Member of the scientific jury:** Assoc. Prof. Tanya Avramova, PhD, Eng.

**1. A general characteristic of the applicant's research and development activities**

For participation in the competition are presented 1 habilitation thesis (monograph), 19 scientific publications, 5 scientific publications in connection with the dissertation and 1 abstract for the acquisition of the ESD "Doctor". The presented scientific publications (in scientific journals and international conferences in Bulgaria and abroad) are shown in detail in Annex № 8. They are distributed as follows:

- Indicator [A] –Habilitation thesis (monograph) - 1 pc.;
- Indicator [Б] – Scientific works – 19 pcs.;
- Indicator [B] – Publications in connection with the habilitation thesis – 5 pcs;

The distribution of the scientific works of the applicant in the competition for the academic position of associate professor is as follows:

- Independent author is in 3 works ([Б15], [Б17], [Б18]);
- First author in 3 works ([Б6], [Б7], [Б9]);
- Second author in 8 works ([Б1], [Б4], [Б5], [Б8], [Б10], [Б14], [Б16], [Б19]);
- Third author in 2 works ([Б2], [Б3]);
- Fourth author in 1 work [Б11];
- Fifth author in 2 works ([Б12], [Б13]).

According to the languages of publication, the applicant submits:

- Publications in English – 14 pcs ([Б1], [Б2], [Б3], [Б4], [Б5], [Б6], [Б7], [Б10], [Б11], [Б12], [Б13], [Б15], [Б17], [Б18]);
- Publications in Bulgarian – 5 pcs ([Б8], [Б9], [Б14], [Б16], [Б19]).

There is an independent monograph entitled „Selection of effective methods and tools for machining the parts by cutting " – [A1]. The monograph is 113 pages long and was published by „Color Print" Varna in 2022, ISBN 978-954-760-547-3.

Ch. Assistant Dimka Vasileva, PhD, Eng. fully meets the minimum national requirements for all groups of indicators for AP "Associate Professor". The total number of points according to the minimum requirements is 430, and the applicant has 1067,65 points. The excess is approximately 2,5 times. The information on the implementation of the scientometric indicators for the applicant in the competition, Ch. Assistant Dimka Vasileva, PhD, Eng., can be summarized by criteria as follows:

| Group of indicators | Contents | Minimum requirements for acquisition of AP "Associate Professor" | Number of points of the applicant |
|---|---|---|---|
| A | Indicator 1 | 50 | 50 |
| B | Indicator 2 | - | - |
| C | Indicator 3 or 4 | 100 | 100 |
| D | Sum of indicators from 5 to 11, | 200 | 257,65 |
| E | Sum of indicators from 12 to 15 | 50 | 180 |
| F | Sum of indicators from 16 to 28, | - | 40 |
| G | Indicator 29 | 30 | 440 |
| **Total** | Indicators from 1 to 29 | **430** | **1067,65** |

The applicant also shows significant research and applied activity. As can be seen from the attached list (Annex 14-6), the applicant in the period 2012-2022 has participated in 3 research projects – 1 project is internal to TU-Varna, and 2 are under scientific research fund. Ch. Assistant Dimka Vasileva, PhD, Eng. has also taken part in 3 educational projects, the financing of which is external to the university and co-financed by the European Social Fund.

Ch. Assistant Dimka Vasileva, PhD, Eng. is a member of various prestigious scientific organizations in our country (Annex 14-7) – member of an association „Club 9000", member of the Bulgarian Institute of Standardization (BIS), member of "Mechanical engineering and technologies" society at Territorial Organization of NTS-Varna, member of the National Scientific and Technical Society "Defectoscopy" (NSTSD).

An author's reference for applied in practice results of the applicant's scientific research is presented (Annex 14-8).

**2. Assessment of the pedagogical preparation and activity of the applicant**

The applicant has participated in the development of 9 curricula in the field of Cutting of the materials and cutting tools, Metal cutting machines, Computer programming of CNC machines and systems.

The applicant for associate professor has a significant teaching activity, for last 3 years has conducted over 400 lecture hours in Educational Qualification Degree "Bachelor" (Annex 14). Ch. Assistant Dimka Vasileva, PhD, Eng. has given lectures and laboratory exercises in the following academic disciplines:

- Computer programming of CNC machines, for Bachelor's degree, 4 course;
- Designing a product in a team – project, for Bachelor's degree, Cutting tools, for Bachelor's degree, 3 course;
- Cutting tools, for Bachelor's degree, 3 course;
- Cutting of the materials, for Bachelor's degree, 3 course;
- Cutting tools - project, for Bachelor's degree, 4 course;
- Metal cutting machines, for Bachelor's degree, 3 course;
- Programming of CNC machines, for Bachelor's degree, 3 course;
- Information technology and systems, for Bachelor's degree, 1 course;
- CNC machines, for Master's degree, 1 course;
- Metal cutting machines and CNC machines, for Master's degree, 1 course;
- Programming of CNC machines, for Master's degree, 2 course;
- Cutting of the materials and cutting tools, for Master's degree, 1 course;
- Programming of material processing machines and systems with CAM, 3 for Master's degree, 1 course.

Under the leadership of Vasileva, PhD 7 graduates defended their degrees. She is a consultant to two PhD students in the MTMT department (Annex 14-2).

One international mobility was carried out under the Erasmus program for teaching in „Gheorghe Asachi" Technical University of Iasi, Romania, 2022; 1 week – 5 days (11.04.2022-15.04.2022) (Annex 15).

Ch. Assistant Dimka Vasileva, PhD, Eng. actively participates in the work with students, which is proven by the attached documents for providing classes in a practical environment outside TU-Varna (Annex 14-5).

**3. Major scientific and applied science contributions**

The contributions contained in the applicant's works can be referred to the following main categories:

**I Scientific contributions**

- A model describing the trajectory of the tip of the tool is proposed for estimating the shape error in the cross-section of the workpiece during a step change in the cutting force during turning. [Б8]
- Equations for the shape ratio coefficient and dimensions of the kth harmonic have been proven and derived. With them it is possible to choose the most suitable combination for the angle of the prism and the direction of measurement, when measuring the deviation from roundness in prisms. [Б5]
- A methodology has been developed and proposed for the analysis of the dynamic system through the frequency and time characteristics, zeros and poles of the system, calculated and graphically displayed using Matlab. [Б9]
- It is proven and theoretically justified that the developed tool for surface plastic deformation (SPD), it is also possible to adjust the deforming force and to measure its magnitude during the machining process SPD. [Б12]

**II Scientific applied contributions**

- An approach has been developed and proposed for using factorial experimental analysis and determining the influence of the main parameters of the SPD process mode on the fatigue resistance of the studied AISI 304 and 316L steels. [Б11]
- An experimental study was conducted and the applicability of the mathematical models for calculating the coordinates of the tool path point was confirmed. [Б12]
- Mathematical models have been developed for the formation of regular microreliefs by surface plastic deformation (SPD) and using a modern vibration-free method. [Б12]
- A theoretically justified approach for switching from one machining method to another method of technological machining of complex rotary surfaces is proposed. [Б7]
- An algorithm has been developed for the selection of appropriate measuring tools and measurement methods. [Б1]
- A new method sequence approach has been developed for fracture fatigue testing of different types of materials, machining methods and experimental plans involving a different number of influencing factors. [Б11]
- It has been demonstrated by experimental investigation that the stable operating ranges of a CoroMill 490-050Q22-08M milling head can be determined in terms of the value of the relative displacement generated during the face milling process. [Б13]

**III Applied contributions:**

- The practical necessity of introducing the GPS standards in Bulgaria in the Bulgarian language has been proven, aiming at the correct understanding and application of the new symbols, which would lead to their wide use in practice. [Б10]
- An experimental bench was constructed for the evaluation of the main axes of stability of a CNC lathe machine, which finds application in practice. [Б8]
- An experimental setup was developed and implemented in practice to study the influence of parameters: cutting speed; feed rate, the actual number of cutting edges involved in the milling process; the minimum thickness of the cut material layer and their relative displacement in the tool-workpiece system relative to the roughness parameter of the machined surface Ra. [Б13]

The applicant has been cited a total of 22 times as follows (Annex 5-3): **17 times** in scientific publications in peer-reviewed and indexed in Scopus and WoS volumes of conferences, **5 times** in other databases.

**4. Significance of contributions to science and practice**

I evaluate as significant scientifically applied and applied contributions. They are enriching the theory and engineering practice in the field of the announced competition in „Cutting of the materials and cutting tools ".

The volume of citations submitted by the applicant and the fact that the majority of them are in the globally recognized databases Scopus and WoS, prove the recognition of the applicant by the scientific circles at home and abroad and confirm his scientific achievements.

They are fully complied with, having exceeded the quantitative indicators of the criteria for holding academic position "Associate Professor".

**5. Critical remarks and recommendations**

I have no fundamental objections to the scientific works of the applicant.

Based on an analysis of the materials presented to me, I can make the following recommendations to Ch. Assistant Vasileva PhD, Eng.:

- To expand his work with students and doctoral students, as their scientific supervisor, which would contribute to the development of young staff and the creation of a scientific team, implying obtaining even more significant results;
- To think about publishing educational literature in which to include the achievements of her scientific activity;
- To concentrate on participating in scientific projects, where she will be able to develop her scientific potential.

**CONCLUSION**

***Based on my acquaintance with the presented scientific works, their significance and the scientific, scientific-applied and applied contributions contained in them, I find it reasonable to propose Ch. Assistant Dimka Kostadinova Vasileva PhD, Eng. to take the academic position "Associate Professor" in in professional field 5.1. Mechanical engineering, specialty „Cutting of the materials and cutting tools ".***

Заличена информация
по Регламент (ЕС)
2016/679

**12.09.2022** **JURY MEMBER:**

***(Assoc. Prof. Tanya Avramova, PhD, Eng.)***