

STANDPOINT

**By Prof. PhD Eng. Emil Marinov, RU "Angel Kanchev", Ruse
For a dissertation for awarding the educational and scientific
degree "Doctor"**

**On the topic: Study of the working process of a diesel engine
working with the addition of alcohol**

Candidate: Eng. Daniel Krasimirov Kostadinov

**Department of Mechanical Engineering, Faculty of Mechanical
Engineering at the Technical University of Varna**

Doctoral Program Internal Combustion Engines,

Research Area 5.1 Mechanical Engineering

Supervisors: Assoc. Prof. PhD Eng. Krasimir Kostadinov,

Assoc. Prof. PhD Eng. Radostin Dimitrov

According to the submitted documents for the announcement, participation and defense of the dissertation, it can be concluded that everything has been done in accordance with the normative documents of the law and those of the Technical University of Varna. A plagiarism check was also made in AI Plagiarism Cheken, where no plagiarism was found. This gives grounds for conducting this procedure.

PhD student Daniel Krasimirov Kostadinov was born in August 1990. During the different periods he worked as a design engineer and chief designer in the field of transport and energy.

He graduated from the Bachelor's and Master's programs at the Technical University of Varna. He completed his PhD studies at the Department of Mechanical Engineering, scientific field 5.5 Mechanical Engineering in the doctoral program Internal Combustion Engines.

He has a very good command of English and Russian. He has competencies and computer literacy.

1. Relevance of the developed problem

In modern scientific research, the problem of creating and using not only alternative fuels for diesel engines, but also the possibilities for improving the environmental performance of diesel engines remains relevant. Potential solutions in this direction are found in biofuels and fuel mixtures with alcohol additives.

The use of alcoholic fuels in carburetor engines has found lasting application. However, in diesel engines, research with alcohol additives to the main diesel fuel continues. For this purpose, mixtures with butanol, ethanol, methanol, etc. are of interest. in certain percentages, as well as their impact on the power, economic and environmental performance of the diesel engine.

2. Contributions to the dissertation

I generally accept the contributions made in the dissertation. Reaching them is a consequence of the correct way of approaching the problem, the in-depth literary analysis, the theoretical and experimental preparation of the PhD student, which has given him the opportunity to specifically formulate the purpose and objectives of the research.

8 contributions have been formulated, of which 5 are applied scientific and 3 applied contributions.

Applied scientific contributions can be defined as follows:

- Improved material problem (1, 4);
- Enrichment of existing knowledge (2,3,4);
- Creation of a new database (6).

The practical contributions are as follows:

- Experimental data on the influence of alcohols on the engine when working with fuel mixtures, necessary for research and practice, are presented (1, 2);
- Experimental systems have been improved (3).

In this regard, I must note that I also accept the 6 main conclusions made, which are the result of the research carried out.

3. Critical Notes on the Dissertation

I have no specific remarks. The dissertation is well structured. The presented materials show the in-depth knowledge of the PhD student on the studied problems.

I would ask some additional questions:

- I did not find a comment on the aggressive behavior of fuels with alcohol towards engine parts;

- In this regard, what additional measures are needed?

Before concluding, I would like to note that the presented abstract is formatted in accordance with the regulatory requirements and fully reflects the research commented in the dissertation. The titles of four scientific publications on the dissertation, presented at scientific forums in front of a highly qualified audience, are presented.

I rightly give a positive assessment of the developed dissertation, which meets the requirements of the Law on the Protection of Persons with Disabilities.

Conclusion

On the basis of the materials on the dissertation and the results obtained from the PhD student, Mag. Eng. Daniel Krasimirov Kostadinov, I believe that all the requirements for awarding the scientific and educational degree "Doctor" are fulfilled and I recommend to the esteemed jury to award the doctoral and scientific degree "Doctor" in the professional field 5.1. Mechanical Engineering, PhD Program Internal Combustion Engines.

May, 2025

REVIEWER:.....

/Prof. Emil Marinov/