

SUCCESS: Research space technologies at Rēzekne Academy of Technology



Rēzekne Academy of Technology and SIA "Allatherm" in a joint research and development project of the European Space Agency are investigating the possibilities for superhydro and aerophilic surface heat exchange equipment of metals obtained with the help of laser technology in space vehicles.

The development time of the project "Development of Functional Surfaces for Space Applications using Industrial Short Impulse Laser (DFS-SAIL)" is 15 months, and its total funding is 100 thousand euros.

This is the first project where Rezekne Academy of Technology cooperates with the European Space Agency.

"In general, there is an excellent representation of the space industry in Latvia, which organizes both seminars and individual consultations, therefore the administrative part of the project application caused quite a few headaches, however, formulating, planning and filling out the project application was certainly difficult," admits the Master's study programs of the Rēzekne Academy of Technology Antons Pacejs, director of "Lāzertehnoloģija".

The limits of application of laser technology will expand

The scientific manager of the project, the leading researcher of the Rēzekne Academy of Technology, Professor Ljubomirs Lazovs, is sure that the project will allow to expand the limits of the application of laser texturing technologies, to gain new knowledge and experience in the processing of materials used in spacecraft.

"The planned results of the project could significantly improve the efficiency of heat exchange equipment, which is very important in the space industry," believes Donatas Mishkinis, head of SIA "Allatherm".

Dean of the Engineering Faculty of Rēzekne Academy of Technology p.i. Professor Andris Martinovs emphasizes that this space project will not only promote research, cooperation with industry and attract funding to the region, but will also provide an opportunity for students to participate in real research related to space technologies.

Looking for various industrial applications

A. Pacejs explains that this project is important because, using microprocessing, different periodic micro- and nano-sized structures with different properties can be formed on metal surfaces with a laser beam. For example, naturally occurring lotus leaves have hydrophobic properties that can be used as anti-icing surfaces, while some insects, such as cicadas, have structures on their wings that have antibacterial properties - they can be used as coatings for handles on public transport. Shark skin, on the other hand, has microstructures that reduce friction with liquid, which is useful for transporting liquids over long distances - reduced friction allows the use of a less powerful pump and ensures resource economy.

"There are many such examples from nature. Our researchers and engineers try to find and validate various industrial applications of such surfaces in applied research and experiments," said A. Pacejs.

Wide application in many industries

The Academy continues to develop and improve its laboratories and study programs, providing competitive education and applied research opportunities in Latvia and internationally. The Rēzekne Academy of Technology is one of the centers in the field of laser technologies in Latvia, especially in macro and micro processing applications of materials.

"Laser technologies have a wide range of applications in many sectors of the economy," says the leading researcher of Rēzekne Technology Academy, Professor Edmunds Teirumnieks.

Rēzekne Academy of Technology offers to learn this knowledge both at the master's and doctoral level. In the Master's study program "Laser Technologies", students gain access to laser processing equipment, which allows not only laser texturing, ensuring such surface properties as biocompatibility, wear resistance, anti-icing properties, specific spectrum absorption, etc., but also to study and implement processes such as synthesis of various materials, thin tubes cutting and cutting metals up to 20 millimeters thick. Most often, such applications are needed in applied research and development projects.

"The biggest advantage is that we are able to achieve these results using only coherent, monochromatic and directed electromagnetic radiation, namely a laser, which is mainly available in the form of industrial systems," emphasizes the director of the study program A. Pacejs.

He adds that until August 27 of this year, it is still possible to apply and apply for a budget place in the only study program of this type in Latvia.

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