

With EVO PT® from EJOT into Space

Interest in lunar exploration is currently experiencing a remarkable upswing, driven by technological advances and the pursuit for new scientific discoveries. International space agencies such as NASA, CNSA, and ISRO, with their various lunar programs, alongside private enterprises like SpaceX and iSpace, are investing significant resources in lunar missions. These efforts aim not only to establish a sustained human presence on the lunar surface but also to access resources such as water and helium – materials that could prove vital for future space travel and energy production. Additionally, lunar research is fostering the development of technologies essential for deeper space exploration, including a future flight to Mars. Recent studies highlight the moon's strategic and economic value, suggesting it could evolve into a billion-dollar market within the next decade.

The Berlin-based start-up Neurospace GmbH has set its sights on developing affordable, reliable technologies for lunar exploration. The company is designing innovative lunar rovers capable of exploring the moon's surface autonomously in swarms. By combining advanced robotics, artificial intelligence, and robust design, Neurospace has already made significant strides.

These rovers are built to carry a variety of scientific instruments across the harsh lunar environment, enduring extreme temperature fluctuations and navigating challenging terrain. Through international partnerships with space agencies and companies, Neurospace seeks to play a pivotal role in the new era of lunar exploration and lay the groundwork for future crewed missions.

Currently, Neurospace is preparing an experiment to validate the space suitability of key rover components. This involves a series of mechanical and electrical tests, which will take place during a suborbital flight aboard Nyx, a capsule developed by "The Exploration Company". The components will be subjected to intense radiation, microgravity and the vibrations of the rocket launch – conditions designed to push their durability to the limit. The data obtained will be essential to ensure the components are not only operational but also durable and reliable. To support this effort, Neurospace has partnered with the start-up Lambspace, a subsidiary of the automotive supplier Hoffmann Kunststoffe. Lambspace specializes in the use of plastics - such as PEEK - in space travel. Some of these components are fastened using EVO PT® screws from EJOT.

The design of the EVO PT® screw makes it particularly well-suited for direct fastening into plastic components. Its use eliminates the need for thread cutting, saving both time and production costs. This is especially beneficial for space applications, where dependable assembly is critical. Multiple fasteners are used in the design to maximize structural integrity and ensure component safety. Thanks to thorough preliminary analysis of the PEEK material and its compatibility with the EVO PT®, along with expert guidance

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from EJOT, a suitable assembly torque was defined and successfully applied. The screw's lead-in threads made installation notably easier, especially in areas with limited accessibility.

Extensive tests were conducted to simulate the intense mechanical stress that payloads experience during launch. The components passed all tests without any issues and are now cleared for their space flight – thanks in no small part to high-performance fasteners like EJOT's EVO PT® screw.

Further information about NEUROSPACE:

<https://www.neuro-space.de/>



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Legend I:

Neurospace Lunar Rover – Transports scientific instruments under extreme conditions

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Legend II:

EVO PT[®] – Secure and cost-optimized direct fastening with digital services for an optimized component design

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