KISTLER
measure. analyze. innovate.

Success story

Aligning the inner with the outer fire

Faraday Rocketry successfully uses Kistler measurement technology for rocket engine testing

A Spanish student team has achieved success after success with their sounding rockets. After two award-winning performances at the European Rocketry Challenge, the Valencia-based organization set an ambitious goal of reaching outer space. In partnership with Kistler, Faraday Rocketry is developing its own rocket engines, including propulsion testing, vibration testing, and static fire testing.

New Space is a business and technology field that has emerged over the last 15 to 20 years. Thanks to innovative rocketry and the industrial production of space equipment, payload rates and overall costs for space launches have dropped dramatically – by about a factor of 20. Consequently, many new players are entering this market. Programs and competitions start as early as the university level, such as the European Rocketry Challenge (EuRoC) in Portugal. Since 2020, many student teams from all over Europe have competed year after year in different categories, such as Design, Flight, and Payload, with their sounding rockets.

From successful sounding rockets to aiming for outer space

One such team is Faraday Rocketry UPV from Valencia. Since its establishment at the Universitat Politècnica de València in 2021, the team has developed five sounding rockets: Aspera, Astra, Genesis (which won a Flight Award at EuRoC 2023), Skybreaker (which won another Flight Award in 2025), and Origin, which has been its most ambitious project: a two stage rocket that broke the Spanish national record of apogee, achieving the astonishing altitude of 10,843 meters in its second launch. With Origin, the team has kicked off the pursuit of a clear goal: to reach the Kármán line, which is 100 kilometers above sea level and is widely accepted as the frontier between Earth and outer space.

"The team's vision is that Europe has the potential to compete in the new space race, and we are the generation with the will and ability to make it happen," said Alberto Pérez, one of Faraday Rocketry's Chief Propulsion engineers. More than 60 students from eight different departments, ranging from avionics to manufacturing to marketing, are engaged in the university team. Measurement experts from Kistler have been partners since the beginning, and Faraday Rocketry has successfully used Kistler equipment, especially for challenging static fire tests.

Kistler Group
Eulachstrasse 22
8408 Winterthur
Switzerland

Tel. +41 52 224 11 11
info@kistler.com

Rocket propulsion testing including static fire testing

A reliable and robust propulsion system is essential for a successful rocket launch. The Propulsion Department at Faraday Rocketry plays a critical role in this regard, ensuring that the rocket engine meets the necessary thrust and total impulse requirements without affecting other components. This includes maintaining vibrational compatibility with elements such as the airframe and avionics bay, respecting weight limits, and performing these tasks without thermally compromising the rocket.

Álvaro Teijeiro, the second Chief Propulsion engineer, reports: "In the early years, Faraday Rocketry relied on commercial off-the-shelf (COTS) rocket engines. These components were purchased from specialized manufacturers, providing an economical and reliable solution for our needs.” As the team grew, so did its propulsion requirements and ambitions. Thus, the department began a project to upgrade its knowledge and capabilities by developing a student-researched-and-developed (SRAD) rocket engine – designed, manufactured, tested, and validated by the team itself.

Testing equipment from Kistler plays crucial role

When discussing the performance statistics of a rocket engine, thrust, impulse, and internal engine pressure are some of the most important parameters. Accurate and reliable measurement of these magnitudes is essential when performing a static fire test. “Thanks to Kistler, the propulsion department can measure and quantify these values with the utmost accuracy. We use three different piezoelectric sensor technologies for static fire testing: a force sensor, a pressure sensor, and an acceleration sensor,” Álvaro explains.

The 9103C piezoelectric force sensor measures thrust and engine combustion duration. “This allows us to determine how the propellant, the nozzle, and the entire propulsion system behave, thereby validating previous simulations and the rocket engine itself. Furthermore, two of the engine’s most important metrics are derived from measuring thrust over time: total impulse, which indicates how much useful energy the rocket engine generates, and specific impulse, which serves as an efficiency metric by showing how much energy the engine produces per unit of mass of propellant.”

A 603CAA pressure sensor from Kistler measures the pressure in the rocket engine's combustion chamber. Precise measurement of the internal pressure allows the Faraday Rocketry team to ensure the engine operates within expected pressure limits, guaranteeing its overall safety. Finally, the 8702B accelerometer measures radial accelerations caused by combustion in a simple, straightforward way. This information is vital to ensuring vibrational compatibility with the overall rocket structure.

Kistler Group
Eulachstrasse 22
8408 Winterthur
Switzerland
Tel. +41 52 224 11 11
info@kistler.com

Reliable rocket engine testing as a basis for further successes

Faraday Rocketry, a student-run rocket team, faces many challenges on its way to outer space. Their Origin rocket was successfully launched for the first time in February 2026, reaching an apogee of 4,057 meters above sea level, and set a new Spanish record of 10,843 meters in May. Alberto concludes, "Thanks to Kistler's strong personal support, especially in our early years, we were finally able to perform consistent static fire tests. These tests provided us with crucial data for our project. Faraday Rocketry is therefore very grateful for the partnership with Kistler and relies on its equipment for our journey to space."

Image material (please name the Kistler Group as picture source)

Origin, Faraday Rocketry's rocket that reached 10,843 m and broke the national record, standing in the launch rail just moments before the launch.

Static fire testing: Origin's second-stage rocket engine, the LF-75, was mounted in their testing facilities alongside several Kistler sensors that measured pressure, force, and acceleration.

Experts in rocket propulsion testing: The Propulsion Department at Faraday Rocketry is the main user of the Kistler equipment.

Kistler Group
Eulachstrasse 22
8408 Winterthur
Switzerland

Tel. +41 52 224 11 11
info@kistler.com

The whole team of Faraday Rocketry celebrated the Spanish national record of an apogee of 10,843 m above sea level, reached on May 29, 2026, with their Origin rocket.

Media contact

Kristina Palffy
Senior Marketing Campaign Manager
Tel.: +4212 322 72 655
Email: kristina.palffy@kistler.com

About the Kistler Group

Kistler is the global market leader for dynamic pressure, force, torque and acceleration measurement technology. Cutting-edge technologies provide the basis for Kistler's modular solutions. Customers in industry and scientific research benefit from Kistler's experience as a development partner, enabling them to optimize their products and processes so as to secure sustainable competitive edge. Unique sensor technology from this Swiss corporation helps to shape future innovations not only in automotive development and industrial automation but also in many newly emerging sectors. Drawing on our extensive application expertise, and always with an absolute commitment to quality, Kistler plays a key part in the ongoing development of the latest megatrends. The focus is on issues such as electrified drive technology, autonomous driving, emission reduction and Industry 4.0. Some 2,000 employees at more than 60 facilities across the globe are dedicated to the development of new solutions, and they offer application-specific services at the local level. Ever since it was founded in 1959, the Kistler Group has grown hand-in-hand with its customers and in 2025, it posted sales of 424 million Swiss francs. About 9 percent of this figure is reinvested in research and technology – with the aim of delivering innovative solutions for every customer.