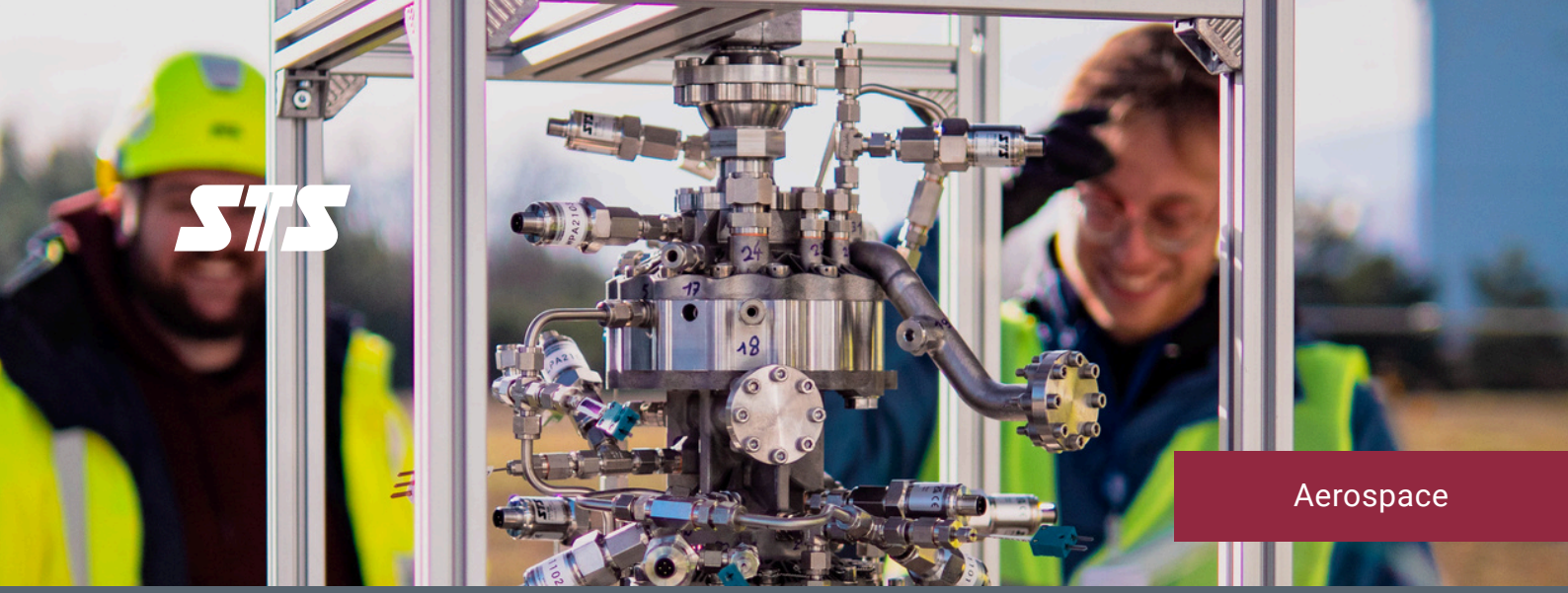

Aerospace

Precise pressure measurement technology enables safe rocket operations

About the Customer

Latitude is an innovative French aerospace company that is redefining access to orbit. Its focus is particularly on so-called small satellites (SmallSats). Founded in 2019 and headquartered in Reims, France, the company is part of the European New Space industry. As such, Latitude develops rocket and launch solutions to place satellites into low Earth orbit reliably, cost-effectively, and at high frequency. A central element of this is the Latitude Launcher. Designed specifically for SmallSat missions, the launch vehicle can precisely transport payloads of up to 200 kg into various orbits. The Latitude Launcher relies on proprietary, 3D-printed Navier engines and stands for flexibility, efficiency, and technical independence in the European space market. Following a multi-year testing phase, the first rocket launch is scheduled for 2027 in Kourou, French Guiana.

Background & Objectives

As Latitude transitioned from the proof-of-concept phase to the development of a fully operational orbital launch vehicle, the company faced new technical challenges. Safety-critical components such as turbopumps, engines, and fuel tanks require highly precise and absolutely reliable pressure sensors. Under real-world operating conditions, these sensors must withstand extreme stresses while delivering stable and accurate measurements.

This is an essential prerequisite for safe and repeatable rocket operations, which is why pressure sensors play a central role in the overall system. The goal of the project was to implement a consistent pressure measurement system that functions reliably not only during testing but also in future flight operations. To achieve this, Latitude required pressure sensors capable of withstanding the high mechanical stresses, intense vibrations, and extreme temperatures encountered during rocket operations. These characteristics are essential for the safe, stable, and repeatable operation of a launch vehicle.

Solution & Implementation

Together with STS Sensors, Latitude adopted an application-oriented approach that consistently took the various deployment scenarios into account. Requirements for measurement accuracy, robustness, and safety were defined early on and specifically tailored to the respective applications. ATM.1ST pressure sensors were used for test operations, while a new dynamic sensor solution is now being used in flight operations. ATM.Mini sensors cover pressure ranges from 0–1 bar to 0–100 bar. For higher pressure ranges between 0–100 bar and 0–400 bar, ML2000 sensors were used. The sensors from STS Sensors offer, among other things, excellent thermal signal compensation, high measurement frequencies, and exceptional vibration resistance, all specifically designed for the application requirements of Latitude. The solution is complemented by elastomer-free options for the safe measurement of liquid oxygen (LOX).

Result

The pressure sensors used provide a reliable metrological foundation throughout all stages of development – from test operations to the actual first launch of the Latitude Launcher. The advanced thermal compensation and high resistance to vibrations and extreme temperatures ensure the high measurement frequency and accuracy required by Latitude. As a result, the sensors from STS Sensors deliver stable and reliable measurement data even under real-world operating conditions. This data is crucial for validating systems, safely monitoring operating conditions, and ensuring the transition from test operations to actual flight operations. With the successful completion of the long-term development phase and the upcoming maiden launch of the Latitude Launcher, the impact of this reliability becomes clear. It is a central prerequisite for ensuring that a launch vehicle is not only developed and tested but can also be safely launched into orbit.

Outlook

The collaboration between Latitude and STS Sensors is designed to be a long-term partnership. It began during the development and testing phases of the Latitude Launcher, is preparing for the upcoming maiden launch, and will continue to support the project beyond this milestone. STS Sensors is contributing its expertise in high-precision and robust pressure measurement technology to reliably meet the technical requirements of rocket operations.
The personal and collaborative exchange – most recently during a joint board meeting in Reims – underscores the mutual trust and appreciation within the partnership. Both sides look forward with confidence to the next project phases, the maiden launch in 2027 in French Guiana, and the continued development of this ambitious endeavor.

Do you have a similar application and would like to discuss potential solutions with us? Please feel free to contact us.

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About STS Sensors

With more than 30 years of expertise, we deliver swiss-made pressure sensors renowned for their reliability and accuracy, trusted across diverse industries. 2,500+ ATM.1ST sensors installed globally, trusted for reliability, accuracy, and robustness in critical applications.