KISTLER
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Press release

Kistler's custom sensors can cope with every measurement challenge – no matter how extreme

The world's largest piezo force sensor can measure up to 450kN

Winterthur, February 2019

With a measuring range of up to 450kN in the Z axis and 100kN in the X and Y axes, Kistler's Type 9397C 3-component force sensor offers unique measuring capacity. This, the largest sensor of its type in the world, is the ideal choice for large-scale measurement tasks such as capturing impact forces in crash tests. The Swiss pioneer of piezoelectric measurement technology specializes in ready-to-use custom solutions that can also cope with extremely high measurement ranges.

"The 3-component force sensor is at the heart of every application that involves measuring very high dynamic forces with the utmost precision," according to Martin Betschart, Product Manager at Kistler. He continues: "Our customer-focused, application-oriented approach is backed by over 60 years of experience in piezoelectric measurement technology. That combination gives us a very precise knowledge of the requirements in different sectors and industries. The new Type 9397C 3-component force sensor shows that there are literally no limits to the scale of the measurement tasks that we can accomplish."

Piezoelectric 3-component force sensors are used in industry to measure dynamic and quasistatic tensile and compression forces. Because these sensors are very rigid, their natural frequencies are high: this enables them to measure the smallest dynamic changes to very large forces in all three directions with high precision and excellent reliability. The sensors are already calibrated and pre-loaded on delivery, so they can be used as soon as they have been installed correctly.

Reliably measuring huge impact forces

One typical application area is measuring the impact of an aircraft's landing gear on the runway. The Landing Gear Drop Test simulates the forces that act on the landing gear as the aircraft touches down. To perform the test, the entire landing gear is raised in a drop tower, the wheel is accelerated and is then dropped onto the sensor equipment. Four sensors are installed in one dynamometer for simultaneous measurements of the forces of 900kN Fz and 400kN Fx/y.

Another application: the groundbreaking crash wall for high-speed trains – the world's first – that has been operating in China since late July 2017. Its measuring range is 20 times greater than the usual ranges for crash tests in the automotive industry.

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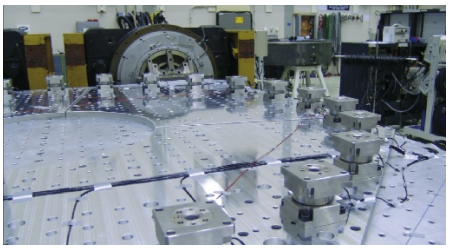
Load tests on space rockets

Spacecraft payloads such as telescopes and electronic instruments are subjected to strong quasistatic and mechanical-dynamic forces during the test phases of space flight programs. To qualify the structures for space flight, vibration and shock test rigs are used to simulate the vibration levels during the load tests. The Force-Limited Vibration Testing method is used to restrict the force applied and prevent damage to payloads because of excessive forces. To achieve this, 3-component force sensors are integrated on the interface between the shaker and the payload.

Visuals (Reproduction is free of charge provided that the Kistler Group is credited as the source of the image)

Measurements up to 450 kN: the world's largest 3-component force sensor registers even the smallest dynamic changes to extremely large forces in all three directions.



For Force Limited Vibration Testing, several preloaded 3-component force sensors are wedged between two metal plates. The structure is mounted on a shaker. The payload is positioned on the uppermost ring.

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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 owner-managed 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 2 200 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 2018, it posted sales of CHF 475 million. About 8% of this figure is reinvested in research and technology – with the aim of delivering better results for every customer.