

Media release

An early warning system for production

Effective monitoring with strain sensors protects machines and tools

Winterthur, 17 July 2018 – Piezoelectric strain sensors from Kistler safeguard machines against overload and help to achieve precise monitoring of the stresses on tools in production sectors where technologies such as punching, forming and joining are used. Simple installation and wide measuring ranges make these sensors ideal for retrofitting on existing plants.

With advances in digitization as we move towards Industry 4.0, sensors are gaining more and more ground in industrial manufacturing – even conquering sectors where the processes are mainly mechanical. Examples include punching and press-fit technologies as well as forming and joining processes. When the aim is to increase the options for monitoring processes such as these, strain sensors are an excellent solution: they can either be mounted directly on the machine or integrated into tools as measuring pins.

Anything but superficial

Piezoelectric (PE) surface strain sensors from Kistler deliver high-resolution measurements of the strain in a structure. The strain is transmitted to the measuring element as a shear force, via static friction. Measurements feature long-term stability (with no creep), and these rugged sensors are protected against overloading (degree of protection: IP67) and resistant to interference from disturbance variables such as temperature influences.

Thanks to their extremely compact design, the sensors can be fixed directly onto the machine in the appropriate position with just one screw. If irregular force peaks occur, they are registered immediately with no risk of the sensors themselves being damaged – in case of overload, they 'slide' on the surface until the strain is relieved. It makes no difference whether the forces occurring are very small or very large – thanks to their high natural frequency and wide measuring range, these sensors can cope with both. Piezoelectric surface strain sensors from Kistler therefore act as an early warning system, delivering effective machine protection that helps to reduce costly downtime.

Tool monitoring made easy

Sometimes there is also a requirement to obtain valuable process data on individual assembly steps. To meet this need, Kistler also offers strain sensors that can be integrated directly into the tool as measuring pins. This option offers effective monitoring and optimization for applications in punching and forming technology, among others. Kistler's highly sensitive measuring pins detect the smallest deformations of the material, even under highly dynamic and quasi-static loads.

Integration in the tool requires a cylindrical bore hole in which the measuring pin is preloaded with axial or radial alignment. In this way, extension and deflection can be measured either longitudinally or transversely to the sensor. Measuring pins are mainly used where the conditions are not suitable for a measurement on the surface, or the installation space is very limited.

Digital signal evaluation simplifies the measurement chain

As from the start of this year, Kistler is offering the 5074A charge amplifier which digitizes PE signals: for the first time ever, users can now integrate any desired piezoelectric sensors into the control environment. Thus, customers now have the opportunity to connect PE strain sensors with the machine control via Industrial Ethernet. There is no longer any need for the detour via an analog evaluation system, and networking with higher-level systems is simplified – a quantum leap towards Industry 4.0 and the industrial Internet of Things.

For more information on strain sensor technology from Kistler, visit:

<https://www.kistler.com/en/applications/industrial-process-control/process-monitoring-forming/>

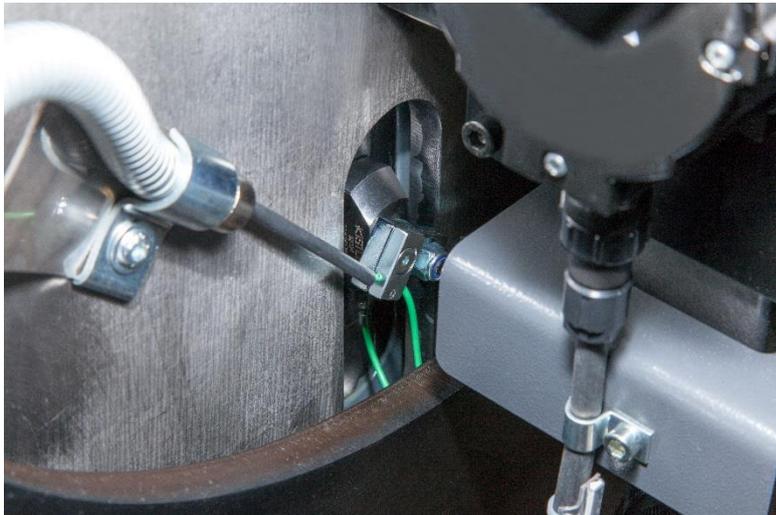


Figure 1



Figure 2



Figure 3

Figure 1: Kistler strain sensors are rugged and resistant to interference, and they are easy to install and retrofit.
Figure 2: To prevent the machine from jamming, Kistler strain sensors monitor the forces applied and the process sequence.
Figure 3: Kistler's Type 9232A surface strain sensor also captures dynamic or quasi-static forces on moving components with high precision.

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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 1 860 employees at 61 facilities across the globe are dedicated to the development of new solutions, and they offer application-specific support at the local level. Ever since it was founded in 1959, the Kistler Group has grown hand-in-hand with its customers and in 2017, it posted sales of CHF 422 million. About 8% of this figure is reinvested in research and technology – with the aim of delivering better results for every customer.