Strain Systems Inc. was established in 2008 with the name Kistler Sensors to bring to market Walter Kistler’s latest invention, the StrainCell™ sensor. The patented instrument results from his long-held vision to solve a persistent problem in the silo-weighing industry: the issue of temperature-induced errors in readings.

Product development and field trials continued into 2011. As the StrainCell proved itself in real-world applications, Kistler Sensors formally announced the new technology in October 2011 and began establishing a market presence and building a global distribution and sales system.

In January 2012, in acknowledgment of the high accuracy afforded by the new sensor, the company announced the Kistler SOLO™ – now Strain Systems SOLO™ – and a new focus: turning silos to scales™. The SOLO combines the StrainCell with intelligent electronics to provide a turnkey weight and level measurement solution for bulk material storage and inventory control.

Software releases soon followed as the company began exploring technological avenues for improving customers’ experience with its products. The SOLO Silo Scale Manager enables customers to set up, configure, and communicate from anywhere in the world on public or private networks with the SOLO systems installed on their silos or storage bins. SOLO Connexion™ is an industry first that turns customers’ Android-based cellphones into remote control and monitoring devices that display real-time silo weight readings.

In May 2012, Kistler Sensors’ name was officially changed to Strain Systems Inc. with no change in the company’s near-term emphasis of providing accurate, reliable, continuous, nonintrusive weight and level measurement solutions for silo inventory management.
Technology

Strain Systems’ patented sensing technology is designed to solve industrial problems in strain measurement. Because the StrainCell™ design mechanically compensates on dual axes against expansion and contraction due to thermal effects, the instrument provides intrinsically temperature-compensated monitoring of strain on metal surfaces.

In both in-field and test performance comparisons, the StrainCell has consistently outperformed all other bolt-on sensors. A controlled study in a fully exposed outdoor environment with ambient temperatures ranging from 65ºF (18ºC) to 107ºF (42ºC) compared the StrainCell to bar- and L-shaped sensors. Test results revealed that the StrainCell technology maintained stability and repeatability across the significant temperature range, showing error readings within 2% of the original reading, while competitor gauges, due to the limits of their design, showed readings with errors as much as 30% under no actual load change. These errors resulted entirely from temperature expansion and contraction.

Products

StrainCell™

The StrainCell sensor installs with a single bolt to the exterior surface of silos and other bulk storage structures. It compensates for temperature-related errors during expansion or contraction to ensure highly accurate weight and level measurement of bulk storage materials. It measures in two directions and mechanically amplifies deflections and distortions to provide the best accuracy and reliability in the industry.

SOLO™

The Strain Systems SOLO pairs StrainCell sensors with intelligent electronics to process signals from the sensors and make readings available either locally or remotely. Readings from StrainCells can also be integrated into corporate information systems to automate accounting and process control. Measurement readings are viewable on-site or anywhere in the world via interfaces for 4-20 mA, 0–10 V, R-485, USB, and Ethernet.

SOLO has been optimized separately for legged silos (SOLO Beam model) and for skirted silos (SOLO Skirted model). On legged silos, the weighing system offers better than 1% accuracy, while it has been achieving better than 3% accuracy with skirted silos. These performance levels approach those of expensive load cells but at much lower cost.

Applications

SOLO systems are presently monitoring weight and level for powered cement, plastics and resins, gypsum, iron ore, asphalt, limestone powder, and limestone rock. These installations are at customer plants in the USA, Guatemala, Mexico, Canada, India, and elsewhere in the world – in both legged and skirted silos.

The Future

Strain Systems is assessing additional applications for its technology in a cross section of industries from fatigue monitoring in wind towers and bridges to crane safety, on-board vehicle scales, and other structural integrity surveillance.