

Strainsense Enterprises... A load cell leader

By Thomas Dolan

Ever wonder what goes into those devices which allow you to test up to five million pounds or more?

Here's the story of a leading company in this arena – Strainsense Enterprises.

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Wire rope, slings and chains have to be able to bear a certain weight, sustain a certain tension, or withstand a certain tension or they break. To make sure their capabilities are within the parameters for which they are designed, they need to be tested. In the past, such tests were typically conducted using mechanical pressure gages, a device with limited resolution and accuracy, to measure the strength of the test material.

Starting in the 1970s, a new and improved measuring device began to replace the pressure gages. These are called load cells, which proved to be more accurate, dependable and durable, with increased resolution.

A load cell is a piece of metal, normally steel or aluminum that is machined to certain requirements and specifications for the particular capacity and use of the test. Mounted or bonded to the metal structure are strain sensors, which register the actual displacement of the material when it is pulled or compressed. The displacement is measured in micro strain that is translated onto a digital monitor, indicating the actual force during the test.

"A load cell is more accurate and has better resolution than that of a pressure transducer," says Layne Vranka, president of Strainsense Enterprises, Inc., McKeesport, PA. "In addition to the increase in accuracy, the load cell is much more durable and maintains its accuracy after repeated use. Load cells were designed as an improvement over or to enhance and increase the data acquisition of the test, and they now are used in every industry throughout the world."

Strainsense Enterprises, Inc., was founded in 1973 by Layne's father Ronald S. Vranka. He was a project engineer for United States Steel



Load cell calibration system.

Research who worked with load cells when they were first being introduced to the steel industry. As a holder of four US Patents related to the use of load cells in the continuous casters of the steel making process, he recognized their potential not only for the steel industry but also, for other industries where data acquisition needed to be improved. The business began as a side venture that then grew into a full time business as the demand increased for the digital load cell systems, and were sold both, nationally and internationally.

Strainsense Enterprises, Inc., is a family business. Ronald was largely helped by his wife, Sandra, who worked as a secretary and bookkeeper. "Those days were very tough," says Layne's mom. "Raising two energetic, sports minded boys and trying to run a business was very stressful. However, it was certainly worth it and I would do it over again. I am very proud of the moral and technical development of both of my sons and their families." Both parents are still active in the business, but the reins are being

passed to the second generation. Layne, a graduate of Marshall University, now runs the business. His brother Steve, a mechanical engineer works in sales and new developments, and his cousin Mark Humenik, a long time employee, oversees the final testing and construction of the load cells and systems. Dave Gamrat (not a relative) is the head machinist in charge of the mechanical specifications of the load cells.

The company designs and builds load cells for a wide variety of industries, including wire rope, steel and concrete. "The load cell is a very accurate and durable animal," Layne says. "It is designed in all shapes and sizes, with capacities from under a pound, up to millions of pounds. My dad quickly recognized that the device could be used to improve the quality of testing in a number of different industries."

In addition to being used in testing machines, Strainsense Enterprises, Inc., was a pioneer in producing complete digital load cell calibration systems for the calibration industry.



Strainsense Enterprises, Inc.

New wire rope ANO load cell system.



Load cell system.



General load cell.

Whereas a standard load cell is put in a production line and does the standard testing throughout the year, it needs to be checked for accuracy and calibrated on a routine basis. Digital load cell calibration systems were developed early on in the business to replace the large and bulky mechanical based, proving rings, and were used to calibrate the load cells, pressure transducers and pressure gage systems used in mechanical testing machines. "A calibration load cell is at least ten times more accurate than a standard load cell," says Pete who coordinates the calibration field. "And must be certified routinely to ASTM E74 Standards. This process improves the quality of the goods being tested and maintains the same accuracy specifications throughout the industry. One of the first calibration systems produced and sold in 1973, by Strainsense Enterprises, Inc., was a one million pound capacity system used for certifying mechanical testing machines and wire rope machines---and it is still in use."

In addition to private industries,

Strainsense Enterprises, Inc., provides calibration load cells and systems to government test agencies and private calibration companies who use them as load transfer standards to certify calibration grade load cells and systems to ASTM E74 specifications. "These are the top of the line load cells and systems. Other customers are industries, from automotive to aerospace, both, nationally and internationally. Moreover, Layne says, "Each industry has different needs, to which we can respond. For instance, we design and manufacture load cells systems for the mass transit and railroad industries to check and test the force of their braking systems in the locomotives and cars. Being a small business has the advantage to provide custom systems economically and quickly, unlike large companies who cannot afford to change their standards and offer custom instruments at the same cost. And most importantly, being a small business has the 'big' advantage of having an understanding and hands-on relationship with the customers and not thinking of them as just another number or purchase order."

It may first appear that the result would result in endless complications of one custom design after another, but, as Layne explains, "We are oriented to meet the customer's requirements and our basic philosophy is to provide the customer with the most accurate, efficient and economical system that fits all of their needs."

The competition?

"There are many load cell manufacturers," Layne acknowledges. "Every manufacturer offers load cells, and many are similar in many respects; however, we try to exceed by offering a better instrument with more features. These features include custom designs at practically no increase in costs, custom threads, heavy duty models for special environments, longer warranties, chromed covers, handles, connector protectors, just to name a few".

Strainsense Enterprises, Inc., not only designs and machines their load cell, but also has the equipment to machine other types of instrumentation, including custom extensometers with unlimited gage lengths, to measure the mechanical displacement of the test specimen. "For a small company," Layne says, "We have a large inventory of test equipment and instrumentation that we can offer to a wide variety of industries. We have an excellent reputation in many indus-

tries not only because of our variety of products, but also because of our quality service and follow-up. We do not look at just meeting our warranties, but we provide the customer with continued service and engineering advise. We have many systems in service that are well over twenty years old."

As part of the service, the company repairs all makes and types of load cells and systems, not only its own make. "Our turnaround repair time is very quick, since we understand the urgency. If a rigger's machine is down, we understand that it is his 'bread and butter' and we will work around the clock, or through weekends to get him back into service. Downtime means lost money and we will do everything we can to get our customers up and running. Many of our customers were gratified by our efforts and have sent us letters verifying our efforts."

Strainsense Enterprises, Inc., has a long relationship with the wire rope industry and has been supplying testing systems since the 1970s. Layne Vranka estimates that Strainsense Enterprises, Inc., has been involved in over half of the national wire rope market, both, in new systems and retrofit systems. One recent important innovation provided by Strainsense Enterprises, Inc., for the wire rope testing machines, is the new Heavy Duty Load Cell. The new Heavy Duty models are best suited for test machines where there can be large bending moments, shock loads due to premature specimen fracture or a possibility of repeated overloads above the rated capacity of the load cell. The force-sensing element of the new HD model operates at approximately one half of the stress level than that of a standard grade load cell. "With the type of testing done in this industry, wire ropes or chains often break prematurely if taken to fracture as part of the test," Steve Vranka says. "Some are subjected to forces up to a million of pounds or more. Just visualize a specimen fracturing at these forces. The resultant shock not only effects the structural components of the testing machine, but this force is sensed directly by the load cell which is part of the load train of the machine. Our new HD models are designed and built to withstand this type of shock."

Strainsense Enterprises, Inc., sells their load cells and systems directly to the riggers as well a testing machine fabricators. "Our load cells and/or systems are one of the main compo-

nents of the system and we want to provide our customers with the best systems," says Layne.

During the 70s, 80s and 90s, Strainsense Enterprises, Inc., never spent much attention to advertising and marketing their products. The company relied on their basic customers and lived on referrals. "The referrals have resulted in sales internationally in various countries as Mexico, Argentina, South America, China, Hong Kong, Spain, Germany, Ireland, just to name a few." Layne says. "However, because of escalating competition, we have begun to market our products and services. Look up load cells on the Internet and you will get hundreds of sources, but, I think the thoroughness of our descriptions and excellent past experience give us top listing."

Layne credits the company's success to his loyal, experienced and dedicated employees. Many of them have been with the company over 20 years. He particularly signals out praise for his long time employee and colleague, lab manager Mark Humenik. "Mark, a long time employee, is a perfect example of the Company's work ethics. He is a specialist in his field and works diligently to get the job done. And, above all, he has the customer satisfaction in mind."

Layne Vranka, 37, came to work for Strainsense Enterprises, Inc., after receiving his college degree from Marshall University, where he also earned a full scholarship for successfully playing for the 'Thundering Herd', first as a Quarterback and then his last two years as a Linebacker. "He proved Jack Lambert of the Pittsburgh Steelers wrong," says Vranka Senior, "who claimed that 'Quarterbacks wore skirts.'" After graduation, Layne was invited to 'try-out' for the Canadian Football League, but declined and began working for Strainsense Enterprises, Inc., in 1992. Layne and his brother are self-styled workaholics, typically putting in a 60-hour week, not counting the emergency sessions sometimes required on weekends. "My parents worked hard and their work ethics has been instilled in all of us at Strainsense Enterprises, Inc." Layne's work schedule has been somewhat modified, due to his young family. His wife, Paula, and he have a daughter and son, Rhianna 2½ and Cody 2 months. His hobbies include reading, weight lifting, biking, hiking, shooting and especially tutoring his brother's Steve's son, Stephen on the finer points of football.

In terms of the future, Layne says that the basic company policy will go on and we will continue to offer our

standard services, along with new developments for their customers. The company will always be diversified in many various industries. Not only does this policy help when one industry is down, but the interweaving of technology of the various industries tends to help each industry. Layne acknowledges that he does feel the impact of the overall economy, whether it goes in a positive or negative direction. "Over the past couple of years, the economy has gotten better. We have many goals in front of us, with more and more doors opening. We're obviously optimistic."

Why buy a product made by Strainsense Enterprises, Inc.?

When asked that question, Layne replied, "Our long past performance speaks for itself. Our products are designed and produced solely by us, unlike many companies who purchase components separately and offer a system that is made up of a variety of components made by various manufacturers. Try getting a system like that repaired with limited down time. Whom do you send it to for repair? Our products are produced by us, serviced and backed by us and are made in the USA. We have been in this business going on 33 years and we're here to stay and will continue to back our products as we have done from day one. WRN