EXPLORE WHAT’S POSSIBLE.
FUTEK Advanced Sensor Technology, Inc. is a manufacturer of load cells, torque sensors, pressure sensors, multi-axis sensors, and related instruments and software. Located in Southern California, we’ve built a reputation as a quality provider of test-measurement and control feedback products.

We specialize in the research and development of advanced sensing devices, and our products are used in many industry applications, such as medical devices, automation, and robotics. We vow to produce the highest quality in performance and reliability, and our product line is unique within the test and measurement market. Every stage of design, development, and production is driven by an elevated quality standard. In fact, we guarantee that all of our products will meet or exceed the quality requirements that you outline for us.

We provide the most precise sensor solution for your specific project. A thorough support team is an integral part of the FUTEK experience. We include pre-application R&D consultants as well as post-sales technical support for all our custom solutions.

If you have a test-measurement application or control feedback need, please don’t hesitate to contact us for support. We have experience creating solutions for even the most complex challenges.
Featured Products

LOAD CELLS
- Capacity range from grams to thousands of pounds
- Miniaturization capability
- Amplified and digital output

TORQUE SENSORS
- From 0.04 Nm to 2712 Nm
- Reaction-torque measurement
- Rotary-torque, speed (RPM), angle and power measurement

PRESSURE SENSORS
- Female port and flush mount
- 5 to 10,000 psi capacity range

OEM SENSORS
- High quality, excellent delivery and cost effective
- Cryogenics or non-magnetic type
- Submersible, dual bridge, or fatigue rated

INSTRUMENTS
- Panel mount and hand held instruments
- USB digital connection solutions
- Signal conditioner amplifier options

SOFTWARE
- Measure up to 16 channels
- Live graphing
- Data logging

Certifications and accreditations

At FUTEK, we are committed to producing the highest quality sensors available in test-and-measurement and control feedback industries. Our commitment to high quality means we pay meticulous attention to all the details of production. Every stage of design, development, and production is driven by this quality standard. We are so passionate about our quality assurance that we guarantee our products meet and/or exceed the quality clauses outlined by the International Organization for Standardization (ISO). We proudly carry certifications in the following ISO standards: 9001, 13485, and 17025.

Additionally, FUTEK holds certifications from the American National Standards Institute (ANSI) as a Z540 approved calibration laboratory; as well as RoHS certificates of conformance for our standard product line.

For more information on FUTEK’s certifications and compliances, please visit http://www.futek.com/certifications.aspx

Medical & Pharmaceutical
PRODUCTS IN USE
Miniature S-Beam Jr. (LSB200) paired with Instrumentation (IPM650, IHH500, USB Solutions, or IAA analog amplifier).

APPLICATION SUMMARY
Medical applications require the utmost precision. In IV or saline bag weighing, high-precision, In-Line load cells are needed. For this application, FUTEK’s LSB200 Miniature S-Beam Load Cell will measure the tension force applied by an IV bag.
PRODUCTS IN USE
Miniature S-Beam Jr. (LSB200) paired with Instrumentation (USB Solutions or IAA analog amplifier).

APPLICATION SUMMARY
Integration of sensors in Bio-medical applications require high-accuracy, small size and accuracy (in micrograms). In DNA synthesis, bio-medical engineers can utilize FUTEK's LSB200 for its precision and sensitive capacity range.
APPLICATION SUMMARY
FUTEK had the opportunity to work along researchers at the University of Amsterdam, Netherlands to develop a miniature load button for their dementia research project. In essence, patients were asked to bite down on a clamp to measure the strength of their bite.
PRODUCTS IN USE

A Pancake Load Cell (LCF Series) paired within Instrumentation (IAA analog amplifier, IPM650, IHH500, USB Solutions).

APPLICATION SUMMARY

Portable crane must performance endurance tests to verify the load capacity of each crane. Using a robust pancake load cell provides operators with these verifications.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
Four S-Beam Jr. Load Cells (LSB200) paired with USB Solutions and SENSIT Test and Measurement Software.

APPLICATION SUMMARY
A high-throughput system is designed for scientific experimentation especially used in drug discovery and relevant to the fields of biology and chemistry. Using FUTEK’s LSB200 Miniature Load Cells, high-throughput systems are engineered to analyze behavioral phenotyping.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Utilizing OEM load cells to audit syringes (infusion pumps) provides medical quality inspectors with assurance that these apparatuses will perform up to code.

PRODUCTS IN USE
One S-Beam Jr. Load Cell (LSB200), Side-Mount Series Load Cell (LSM Series), or Load Button Load Cell (LLB Series) paired with Instrumentation (IAA analog amplifier, IPM650, IHH500, or USB Solutions) and SENSIT™ Test and Measurement Software.
APPLICATION SUMMARY
Medical equipment requires precise testing. Utilizing FUTEK’s LSB200 Miniature S-Beam Jr. provides quality inspectors with measurements down to the micro-gram on delicate applications, such as this syringe test stand (infusion pump).

PRODUCTS IN USE
Two S-Beam Jr. Load Cells (LSB200) paired with USB Solutions and SENSIT Test and Measurement Software.
PRODUCTS IN USE
One In-Line Load Cell (LCM Series) paired with Instrumentation and Software (IHH500, IPM650, USB Solutions, and SENSIT™ Test and Measurement Software).

APPLICATION SUMMARY
Many medical facilities utilize load cells during delicate research studies, such as biomaterial testing, for accurate and precise measurement feedback.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
CATHERET TRACK TEST
Interventional device test systems are designed to accurately record the performance features of medical devices including: catheters, guide wires, stent delivery systems, colonoscopes, endoscopes and scope tools. FUTEK’s Submersible Jr. S-Beam Load Cell (LSB210) is fixed to the testing system to measure trackability of the catheter through a tortuous anatomy.

PRODUCTS IN USE
FUTEK’s Submersible Jr. S-Beam Load Cell (LSB210) paired with instrumentation, USB Solutions, and SENSIT™ Test and Measurement Software

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
Miniature S-Beam Jr. (LSB200) paired with Instrumentation (USB Solutions or IAA analog amplifier).

APPLICATION SUMMARY
Accuracy and sensitivity are extremely critical during intravascular procedures. In this application, FUTEK’s LSB200 Miniature S-Beam Jr. Load Cell gives medical practitioners the accuracy and precision that is necessary for robotic intravascular procedures.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Load Cells are often used for surgical instrument verification. In this example, FUTEK’s Miniature Load Button Load Cell (LLB130) is used to calibrate the clamping force of a laparoscopic tool.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY

In the medical industry, guidewire testing can provide a means of evaluating material quality, and core wire consistency and reliability. In this automated guidewire testing system FUTEK's LSB200 Miniature S-Beam Load Cell is integrated to the wire clamp, guided by an actuator, to record the peak force or breaking force of the guidewire under test.

PRODUCTS IN USE

Miniature S-Beam Jr. (LSB200) paired with Instrumentation (IHH500 or USB Solutions).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Gait training and rehabilitation are not modern concepts, but through modern technologies, engineers and researchers are working on developing exoskeletons to help rehabilitate a patient at a more accelerated pace. Critical measurements are gathered during development of motor-assisted exoskeletons to ensure that proper assistance is given at different stages of treatment.

PRODUCTS IN USE
JR S-Beam Load Cell (LSB200) paired with instrumentation (USB220 and IAA Series analog amplifiers).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

APPLICATION SUMMARY
Researchers, doctors, and engineers are creating ways to help patients speed up rehabilitation by allowing them to perform more tasks on their own, with the assistance of specially made bionics. The LSB200 load cell is small enough to mount to the cabling of the glove, in order to measure the forces on the simulated tendons on the hand.

PRODUCTS IN USE
JR S-Beam Load Cell (LSB200) paired with instrumentation (USB220 and IAA Series analog amplifiers).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

APPLICATION SUMMARY
Transcatheter valve replacement is a minimally invasive valve replacement technique that enables valve replacement without the need for open heart surgery. TAVR and TVMR valves are inserted via catheter, inflated and locked into place with a balloon. The bovine pericardial tissue and the bio-compatible metal support structure need to withstand the fatigue of opening and closing in rhythm with a beating heart. To test the fatigue resistance of the valve, a load cell is coupled between a linear actuator and a syringe piston that is pumped up and down to simulate the forces inside a beating heart.

PRODUCTS IN USE
1 LSB S-Beam Tension and Compression Load Cell paired with a USB220 Data Logging System or IAA Series Signal Conditioning Amplifier.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY

For individuals who have lost part or all of a limb, rehabilitation is always a difficult process. For those who have undergone trans-tibial amputation, their prosthesis needs to mimic the tibia, ankle, and foot. FUTEK worked with Humotech in selecting a sensor for a trans-tibial prosthesis that could adapt to an individual’s gait during rehabilitation. By mounting our LCM200 Miniature Threaded In-Line Load Cell in-line with a servo-driven cable system, Humotech was able to create a closed-loop system that adapts to the patient’s gait for a speedier recovery and rehabilitation.

PRODUCTS IN USE

1 FUTEK LCM200 Miniature Threaded In-Line Load Cell paired with IDA100 Digitally Configurable Amplifier.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY

Spinal cord injuries (SCI) often leave the patient with little to no ability to ever walk again. The Institute for Human and Machine Cognition (IHMC) aimed to help solve that with a powered bionic exoskeleton at the 2016 Cybathlon in Zurich, Switzerland. Their ingenious exoskeleton suit, named Mina v2, utilizes power actuators that strap to an individual’s legs, moving their hip, knee, and ankle joints, allowing an individual to walk unassisted. FUTEK sponsored their exoskeleton by providing our LCB200 load cells, which were installed in specialized fixtures IHMC designed, enabling the system to receive accurate force feedback from the motors and closing the control loop, all while allowing the sensor to safely rotate.

PRODUCTS IN USE

6 FUTEK LCB200 In Line Rod End Tension and Compression Load Cells paired with amplifiers (IAA series and IDA100)

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
In the pharmaceutical industry, the last thing that any tablet/pill manufacturer wants is to have their product disintegrate during transport to the customer. Each tablet must have the correct compressive force applied to it to maintain its structure and achieve the desired tablet hardness. To verify that each tablet is compressed correctly, a LCF505 Universal Pancake Load Cell with Tension Base is incorporated into the mechanism that adjusts the main roller to measure compression force.

PRODUCTS IN USE
One LCF505 Universal Pancake Load Cell with Tension Base paired with Instrumentation (IHH500, IPM650, or IDA100)

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
CATHETER TORQUEABILITY TEST
Interventional device test systems are designed to accurately record the performance features of medical devices including: catheters, guide wires, stent delivery systems, colonoscopes, endoscopes and scope tools. FUTEK’s Rotary Torque Sensor – Hex Drive (TRH605) is fixed to the testing system to measure torqueability of a catheter penetrating a tortuous anatomy.

APPLICATION SUMMARY
FUTEK’s Rotary Torque Sensor – Hex Drive (TRH605) paired with instrumentation USB Solutions and SENSIT Test and Measurement Software

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
Pedal Force Sensor (LAU Series) paired with Instrumentation (IPM650, IHH500, USB Solutions, or IAA Series Amplifier).

APPLICATION SUMMARY
Anti-torque pedals control both the direction and pitch of a helicopter in flight. Utilizing pedal force sensors allow engineers to audit the precision of these controls.

* LAU220 version – Spike Resistant
LAU220 available with round mounting plate
PRODUCTS IN USE
NASA JPL space/flight qualified cryogenic dualbridge donut load cell and a space/flight qualified cryogenic 3-component multi-axial sensor.

APPLICATION SUMMARY
FUTEK developed two cryogenic sensors to operate aboard the rover. The donut load cell directly operates within Curiosity's drilling arm. It stands responsible to monitor the drill bit's force as it pierces into the Martian ground. The multi-axial load and torque sensor is responsible for the maneuvers of the robotic arm. Both of these sensors were specifically designed for the Mars Rover Curiosity mission.

Sensor Solution Source
Load Cells · Pressure Sensors · Torque Sensors · Instruments · Software

PRODUCTS IN USE
In-Line Load Cells (Standard LCM Family or customized).

APPLICATION SUMMARY
Military aircrafts deploy parachutes for rapid decrease of speed upon landing. Utilizing In-Line Load Cells allows test engines to audit the force applied to that parachute or structure of aircraft.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
In-Line Load Cells (LCM Family) or Thru-Hole/Donut Load Cells (LTH Family).

APPLICATION SUMMARY
Aerospace parachute deployment mechanics require high precision load cells throughout the testing phase. NASA’s Orion capsule utilized FUTEK load cells to measure the force of the payload applied against the parachute system.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
FUTEK designed two cryogenic load cells able to operate within the cryoradiator of the VIIRS component at the extreme temperature of –300°F (–184°C).

APPLICATION SUMMARY
Within NASA’s Suomi NPP Satellite are five weather instruments. Commissioned by Raytheon, FUTEK designed two cryogenic load cells for the Visible Infrared Imager Radiometer Suite (VIIRS) aboard the satellite.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Landing gear manufacturers utilize load cells to measure shock forces and fatigue ratings during quality assurance examinations. FUTEK’s LCA Series offers a robust miniature design for these high capacity measurements.

PRODUCTS IN USE
Miniature Column Load Cells (LCA Series) paired with Instrumentation (IAC200, IPM650, IHH500, or USB Solutions) and SENSIT Test and Measurement Software.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software
APPLICATION SUMMARY
Characterization of solid, liquid, and hybrid rocket engines is often performed with computer modeling and ground testing. For experimental fuels, aerospike and other experimental altitude compensating nozzles, ground testing is necessary to characterize their thrust curves and $I_{sp}$ in static testing conditions. To accomplish this a LCF series load cell is mated between the rocket engine and the thrust stand. In addition to thrust, by incorporating 4, 3-axis load cells in the test stand base supports, engine mass flow can be directly measured and under certain circumstances vectored exhaust thrust can also be measured.

PRODUCTS IN USE
FUTEK’s Universal Load Cell (LCF Series) mated with instrumentation (IAA Series or USB220) and 4 of FUTEK’s MTA400/MTA600 Multi-Axis load cells each paired with 3 IDA100 digital amplifiers.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Unmanned aerial vehicles (UAVs) come with a variety of launching capabilities, such as hand launching, vertical takeoff, or runway takeoff. With the rise of ever more capable and powerful UAVs, some vehicles require launchers are needed to propel them into the air. These launchers need to apply a minimum amount of force to safely launch the aircraft into the air. To accomplish this, an LCB400 Rod End Load Cell is mated to the launching mechanism to measure the force applied to the UAV.

PRODUCTS IN USE
One LCB400 Rod End Load Cell paired with Instrumentation (IAA100, IPM650, or IDA100)

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
One of the more efficient means of satellite attitude control is using reaction wheels. Reaction wheels scale easily making them excellent candidates for attitude control systems in a CubeSat. They create small torque changes necessary to keep a communication antenna pointing at earth or a telescope pointing at a star. By utilizing a micro torque sensor, the response time and torque output of the motor/flywheel can be measured, allowing for precision control loop gains to be established for the PID balancing functions used to stabilize the spacecraft.

PRODUCTS IN USE
FUTEK’s QTA141 Micro Reaction Torque sensor paired with the USB220 High Resolution USB Solution.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
NASA JPL space/flight qualified cryogenic dualbridge donut load cell and a space/flight qualified cryogenic 3-component multi-axial sensor.

APPLICATION SUMMARY
FUTEK developed two cryogenic sensors to operate aboard the rover. The donut load cell directly operates within Curiosity’s drilling arm. It stands responsible to monitor the drill bit’s force as it pierces into the Martian ground. The multi-axial load and torque sensor is responsible for the maneuvers of the robotic arm. Both of these sensors were specifically designed for the Mars Rover Curiosity mission.
PRODUCTS IN USE
FUTEK Multi-Axis/Gear Shift Load Cell (MAU300) paired with Instrumentation (IAA Analog Amplifier, IPM650 Panel Mount, IHH500 Digital Display, and USB Solution).

APPLICATION SUMMARY
Flight controls require extreme auditing prior to in-flight use. FUTEK’s MAU300 Gear Shift Load Cell provides quality assurance engineers with the appropriate tools to monitor the force applied to helicopter cyclic controls (joysticks).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
FUTEK Torque and Thrust Biaxial Sensor (MBA500) paired with Instrumentation (IAA Analog Amplifier, IPM650 Panel Mount, IHH500 Digital Display, and USB Solution).

APPLICATION SUMMARY
Flight controls require extreme auditing prior to in-flight use. FUTEK’s MBA500 Torque and Thrust Biaxial Sensor provides quality assurance engineers with the appropriate tools to monitor the torque applied to an aircraft’s control column (yoke).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
Tri-Axial Load Cell (MTA400) paired with Instrumentation (IAA Analog Amplifier & USB Solutions)

APPLICATION SUMMARY
Wind tunnels are used in aerodynamic research to study the effects of air moving past solid objects referred to as models. A model is mounted onto a stationary tri-axial sensor which provides measurement of the pressure placed on the object at test.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Industrial robots make assembly lines more efficient and reliable. Paired with a measurement device, operators can use new IAA signal conditioners to send clear, clean signals to logic controllers that govern the speed and position of assembly line machinery.

PRODUCTS IN USE
A strain-gauge, full-bridge multi-axial sensor that measures torque and load paired with the IAA100 (voltage) or IAA200 (current).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Tank dispensing is based on the container’s contents — both inputted and outputted. This application utilizes a full load cell system to ensure equal distribution.

PRODUCTS IN USE
One Pancake Load Cell (LCF Series) paired with Instrumentation (IPM650, IHH500 or IAA analog amplifier).

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

APPLICATION SUMMARY
Measuring the contents of any industrial tank, silo, or hopper requires a robust and precise system. Utilizing multiple high-capacity sensors in conjunction with powerful instrumentation can make for an effective platform.

PRODUCTS IN USE
Four Low Profile Pancake Load Cell (LCF Series) paired with Instrumentation (IAC200 Junction Box, IPM650, IHH500, or USB Solutions).

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software
PRODUCTS IN USE
OEM Side-Mount Load Cell (LSM Series) paired with Instrumentation (IAA analog amplifier, IPM650, IHH500, and USB Solutions).

APPLICATION SUMMARY
Utilizing an adapter button, FUTEK’s LSM Series Load Cell is proficient at measuring the mass flow of solid particles in any process line.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

PRODUCTS IN USE
Four customized Load plates paired with Instrumentation (IAA analog amplifiers, IPM650, IHH500, USB Solutions).

APPLICATION SUMMARY
Large waste management containers are intended to collect trash until they reach a specific capacity. Once that capacity is reached, disposal of the contents is necessary. Utilizing load cells helps monitor the container’s capacity increase.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Agricultural poultry feeders are responsible for the equal distribution of feed throughout a poultry house. Agricultural engineers often implement rotary torque sensors to monitor the motors operating each feeder.

PRODUCTS IN USE
Rotary Torque Sensor (TRS Series) paired within Instrumentation (IPM650, IHH500, or USB Solutions).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
One load cell (LLB Series) used per each supporting joint paired with Instrumentation (USB Solutions, IAA analog amplifier, IHH500, and IPM650).

APPLICATION SUMMARY
Known for their endurance testing capabilities, FUTEK’s Load Button Series can be utilized in manufacturing batch weighing applications.
PRODUCTS IN USE
Miniature S-Beam Jr. (LSB200) paired with Instrumentation (IAA analog amplifier or IPM650).

APPLICATION SUMMARY
Load Cells and Force Sensors are commonly used to automate production lines. By using these sensors, production engineers are better able to control the automation process and improve their overall quality.
PRODUCTS IN USE
Load Cells (LSB and LCF Series) paired with Instrumentation (IHH500 or IPM650) with the possibility of collecting data on a Computer/PLC.

APPLICATION SUMMARY
FUTEK’s load cells are designed to fit applications like industrial automation container filling and/or weighing. As shown in the diagram below, a load cell platform is installed in an automation line to help monitor equal distribution through packaging.
APPLICATION SUMMARY
Utilizing a multi-axial sensor within an automated manufacturing line, such as a capping press, ensures precision and consistency.

PRODUCTS IN USE
A Bi-Axial Sensor, measuring torque and thrust, paired within Instrumentation (IAA analog amplifier, IPM650, IHH500, USB Solutions).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Industrial robots make assembly lines more efficient and reliable. Paired with a measurement device, operators can use new IAA signal conditioners to send clear, clean signals to logic controllers that govern the speed and position of assembly line machinery.

PRODUCTS IN USE
A strain-gauge, full-bridge multi-axial sensor that measures torque and load paired with the IAA100 (voltage) or IAA200 (current).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software
Automotive
PRODUCTS IN USE
Pedal Force Sensor (LAU Series) paired with Instrumentation (IPM650, IHH500, USB Solutions, or IAA Series Amplifiers).

APPLICATION SUMMARY
Utilizing FUTEK’s Pedal Force Sensors, automotive manufacturers are able to verify the safety and reliability of their automobile’s braking mechanics.

* LAU220 version – Spike Resistant
LAU220 available with round mounting plate
APPLICATION SUMMARY
Utilizing FUTEK’s Pinch Load Cell, automo-
tive manufacturers are able to verify pinch
force of power windows. This precise, easy
to use hand-held sensor is designed to help
automakers comply with Federal Motor
Vehicle Safety Standard.

PRODUCTS IN USE
Pinch Load Cell (LMD300) paired with
Instrumentation (IAA Analog Amplifier,
IPM650 Digital Display, IHH500 Handheld
Display, and USB Solutions)

All FUTEK application illustrations are strictly
conceptual. Please contact us with questions.
APPLICATION SUMMARY

In the automotive industry, robots are used to cycle test seats for wear and durability. Automakers research how people of all shapes and sizes affect the upholstery, seat cushions and seat structures over the life of the vehicle. FUTEK’s Fatigue Rated Pancake Load Cell LCF456 is integrated into the custom testing robot to quantify data of the compression force placed onto a seat.

PRODUCTS IN USE

Pancake Load Cell (LCF456) paired with Instrumentation (USB Solutions or IPM650 Panel Mount).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY

In a high performance vehicle, the suspension system does more than hold the car up, it adapts to aerodynamic forces on the vehicle, varying road conditions, and driver inputs. In addition, complex multipoint suspension systems in use in NASCAR® and Formula 1® require the use of modeling and simulation to ensure compliance under load. Significant modeling and analysis is undertaken to account for these variables. However, the final step to maximize performance is live testing to validate the simulation model. To accomplish this, load cells are placed in line with each suspension arm, providing detailed information of the load running through each arm, accurate steering load measurements, and indirect front tire grip enabling adjustments of the suspension system to optimize performance and handling.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

PRODUCTS IN USE

5 LCM Series In-Line or LCB series Fatigue Rated Rod End Tension and Compression Load Cells are each paired with a USB220 High Resolution Data Logging System.
APPLICATION SUMMARY

As automotive entertainment UIs become more sophisticated, it’s become harder to control them hands free without looking directly at the screen. The lack of tactile feedback results in the user’s brain wanting to look at the screen to confirm input selection. By incorporating load cells to measure contact force, the on-board computer can confirm correct and incorrect inputs using varying vibrations, ensuring the driver that their input was correctly registered.

PRODUCTS IN USE

4 LSB200 In-line Tension and Compression S-Beam Load Cells each paired with an IDA100 Digital and Analog Amplifier

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
One Rotary Torque Sensor (TRS Series) paired with Instrumentation (IPM650, IHH500 or USB Solution).

APPLICATION SUMMARY
Rotary Torque Sensor are frequently used as auditing tools for motors, power tools, turbines, and generators.

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

PRODUCTS IN USE
One Reaction Torque Sensor (TFF Series) paired with Instrumentation (IPM650, IHH500 or USB Solution).

APPLICATION SUMMARY
Reaction Torque Sensors are frequently used as auditing tools. This application is utilizing FUTEK’s TFF Series to verify the torque moments produced by a motor.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

* Sensor does not rotate.
** Visit the TFF Series Extraneous Load Factor Document to calculate your model’s maximum overhanging moment.
APPLICATION SUMMARY
Stanford’s 2013 Solar Car Project team utilized FUTEK’s Shaft-to-Shaft Rotary Torque Sensor to emulate what the motor will be subjected to on race day through a dynamometer.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Reaction torque sensors are often used as auditing and monitoring tools. This application utilizes the FUTEK TFF Series to measure the reaction torque produced by a miniature electric DC (brushed/brushless) or AC motor.

PRODUCTS IN USE
One Reaction Torque Sensor (TFF Series) paired with Instrumentation (IAA series analog amplifier or the IDA100 digital amplifier).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
Manufacturing
PRODUCTS IN USE
Miniature S-Beam Jr. (LSB200) paired with FUTEK’s USB Solutions for monitoring tension force and data collection.

APPLICATION SUMMARY
Wire tension measurement is an integral part for manufacturers of fibers, cables, and even textile fabrics. This method of measurement allows manufactures to ensure their products fit their requirements.

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

PRODUCTS IN USE
Column Load Cells or Load Buttons (LCA/LLB Series) paired with USB Solutions.

APPLICATION SUMMARY
Press (Hydraulic or Pneumatic) verification testing is a necessary requirement within the automation process. By implementing load cells with USB output, the operator can verify the uniform loading of a large platform. Each load cell serves as a monitoring point within the system.
PRODUCTS IN USE
Two Thru Hole or Pancake Load Cells (LTH Series/LCF Series) paired with Instrumentation (IPM650 or IHH500).

APPLICATION SUMMARY
Implementing load cells and instrumentation can automate multiple systems within tank dispensing applications. This process ensures operators precision measurements in liquid ratios and triggers for valve opening and closing.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
A Pancake Load Cell (LCF Series) paired within Instrumentation (IAA analog amplifiers, IPM650, IHH500, USB Solutions).

APPLICATION SUMMARY
Portable crane must performance endurance tests to verify the load capacity of each crane. Using a robust pancake load cell provides operators with these verifications.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY

Weighbridges are utilized in various industries that manufacture or move bulk items. FUTEK’s LCA Family offers a robust design for high capacity measurements.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

PRODUCTS IN USE

Load Column Cell (LCA600/LCA700) paired with Instrumentation (IPM650, IHH500, IAC200, or USB Solutions) and SENSIT™ Test and Measurement Software.
PRODUCTS IN USE
Subminiature Load Button Load Cell (LLB Series) paired with Instrumentation and Software (IHH500, IPM650, USB Solutions, and SENSIT™ Test and Measurement Software).

APPLICATION SUMMARY
Resistance Spot Welding is a process in which pieces of metal are joined together by the heat created by the electrical resistance of the material combined with the forces applied by the electrode to hold the pieces together. The forces applied by the electrodes are very critical to the process, as the incorrect amount might cause cracks, holes, and failures in the welds. FUTEK’s LLB300 Subminiature Load Button Load Cell helps operators ensure that the welding machine is applying the correct amount of force.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
For sterilized and other sealed packaging, leaks and partially broken seals are not always apparent. To mitigate this and ensure seal integrity, verification of the heat sealing force is critical, as over/under applied sealing force can cause premature failure of the seal. This application utilizes a pair of LLB130 load cells to monitor the force applied to the bag while the seal is made.

PRODUCTS IN USE
FUTEK’s Subminiature Button Load Cell (LLB Series) paired with instrumentation paired with the IAA series analog amplifier for feedback into a PLC.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
During plastic injection molding and die casting, the mold is clamped together to resist the rapid thermal expansion and contraction caused by the molten material filling the mold cavity. Flawed parts can be created if the mold is not kept properly clamped to resist thermal loading throughout the molding and casting process. To mitigate these thermal effects, Pancake Load Cells are placed at the clamp contact points, enabling a machinery monitoring process to adjust clamping forces.

PRODUCTS IN USE
FUTEK’s Universal Pancake Load Cells (LCF Series) coupled with the IAA Series analog amplifier for feedback into a PLC.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Whether you are feeding a wire EDM machine, a wire stripper, or winding electric motor coils, precision wire tension is key to meet today's high performance standards. The key to precision wire tension control requires live monitoring of the wire tension. By utilizing a load cell in-line with the wire tensioner, a versatile wire tensioning system can be developed that can adapt to changing wire quality and conditions. Furthermore this adaptive system can maintain high coil winding quality and repeatability while maximizing process efficiency by preventing wire breakage.

PRODUCTS IN USE
1 In-Line Tension and Compression Load Cell (LCM Series) paired with Instrumentation (IAA Series or IDA100).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Ultrasonic Welding welds together two pieces of material (e.g., plastic) using high frequency vibrations. This results in a clean welding process, producing uniform, fluid tight welds. The clean welding process makes it ideal for medical equipment, toys, semiconductors, and consumer electronics. One of the keys to a clean weld is the proper application of clamping force. Too little force results in an incomplete weld, too much force results in deformed parts. Incorporating a load cell inline with the welding stack enables the ultrasonic welder to provide the correct amount of contact force to every part.

PRODUCTS IN USE
1 LCB/LCF Series Load Cells paired with Instrumentation (IAA Series or IDA100)

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Semiconductor chips are fragile devices prior to packaging and require delicate handling. During Through-Silicon Via (TSV), eutectic, epoxy, or solder based die attach processes, consistent force must be applied to the chip. Incorrect force application causes broken chips and incomplete bonds. Load cells incorporated into the die attach tooling enables closed loop control during this delicate process.

PRODUCTS IN USE
One LCM100 Miniature In Line Load Cell paired with Instrumentation (IPM650, IDA100, IAA300 Differential Strain Gauge Amplifier)

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Measuring fluid flow rate in food production, blood infusions, catheterization, and chemical compounding requires sanitary and sterile processes. Non-contact measurement solutions such as using an occlusion provide one type of flow measurement solution. Additionally, this technique allows for bubble and blockage detection. To measure the force exerted by the fluid on the occlusion, a load cell is incorporated into the clamping mechanism.

PRODUCTS IN USE
1 LSB200 Jr. Miniature S-Beam Load Cell paired with Instrumentation (IAA, IDA100)

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
Thru-Hole/Donut Load Cell (LTH Series) paired with Instrumentation (USB Solutions, IPM650 Digital Display, IHH500 Handheld, or IAA analog amplifier).

APPLICATION SUMMARY
The intention behind bolt fastening applications is to monitor the tension force applied to the fastener, stud or bolt.
PRODUCTS IN USE
A Thru-Hole Load Cell (LTH Series) paired with Instrumentation (USB Solutions, IPM650, and IHH500).

APPLICATION SUMMARY
FUTEK's Thru-Hole Load Cell Series can be utilized for endurance press application, such as toggle force clamping.
PRODUCTS IN USE
Miniature S-Beam Jr. (LSB200) paired with Instrumentation (IPM650, IHH500, USB Solutions, or IAA analog amplifier).

APPLICATION SUMMARY
Many industries use test fixtures to measure their presses or impact stands. FUTEK’s LSB200 Load Cell is suitable for applications needing precise lower capacity impact test measurements.
PRODUCTS IN USE
Subminiature Load Button Load Cell (LLB Series) paired with Instrumentation (USB Solutions, IAA analog amplifier, IHH500, and IPM650).

APPLICATION SUMMARY
Utilizing a Load Button Load Cell, engineers can measure the expansion of a tube as fluid moves through it.
PRODUCTS IN USE
A Pancake Load Cell (LCF Series) paired within Instrumentation (IAA analog amplifier, IPM650, IHH500, USB Solutions).

APPLICATION SUMMARY
Utilizing a robust, high capacity load cell (LCF Series), industrial operators can measure the force applied to materials via a hydraulic press.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
One Load Button Load Cell (LLB Series) with Instrumentation (IPM650, IHH500, or USB Solutions) and SENSIT™ Test and Measurement Software.

APPLICATION SUMMARY
Load cells are frequently used with arbor presses as auditing tools to gauge the amount of force required for a press fit or riveting process.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Using both a rotary torque sensor and load cell, we can establish a relationship between the bolt tension and the torque that is applied.

PRODUCTS IN USE
A Thru-Hole Load Cell (LTH Series) and a Rotary Torque Sensor paired with FUTEK’s USB Solutions and SENSIT Test and Measurement Software.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
In-Line Load Cell (LCM Series) paired within Instrumentation (IAA analog amplifiers, IPM650, IHH500, USB Solutions).

APPLICATION SUMMARY
Wire tension measurement is an integral part for manufacturers of fibers, cables, and even textile fabrics. Industrial cable manufacturers utilize load cells to monitor the tensile forces of their cable.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

PRODUCTS IN USE
One S-Beam Load Cell (LSB302) paired with Instrumentation (USB Solutions, IPM650 Digital Display, IHH500 Handheld, or IAA analog amplifier).

APPLICATION SUMMARY
Since 2001, FUTEK has been performing an extensive reliability fatigue test on our LSB302 S-Beam Load Cell.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCT SUMMARY
A system is defined by its weakest link. Even something as small as the feel of a trackpad is scrutinized to make sure it delivers optimal performance to the end user. In this application, FUTEK’s LSB200 is fixed onto a testing actuator to record tactile feedback, run cycle test and quantify the force required to stimulate touchpad response.

PRODUCTS IN USE
Miniature S-Beam Jr. (LSB200) paired with Instrumentation (USB220).
APPLICATION SUMMARY
Spring testing systems are ideal for high volume production testing, quality control inspection, and design engineering. In this automated spring testing system a S-Beam load cell (LSB Series) is fixed inline of the spring under test to measure the spring force in relation to its position.

PRODUCTS IN USE
LSB Series load cell paired with instrumentation (USB220).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY

In microelectronics production environments, bond testing can provide a means of evaluating bond quality and verifying bond consistency and reliability. In this automated wire bond testing system FUTEK’s LSM300 or LSB200 can be integrated to the cartridge mechanism in line with the testing hook to record the peak force or breaking force of the wire bond under test.

PRODUCTS IN USE

Precision Load Cell or Miniature S-Beam Jr. (LSM300 or LSB200) paired with Instrumentation (USB Solutions).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Motorized insertion and extraction test are performed to determine the durability of a USB thumb-drive. Configuring the test stand with a FUTEK load cell (the LSB200 or LRM200) enables test engineers to quantify the exact force needed to insert or extract a USB connector over time.

PRODUCTS IN USE
- Miniature S-Beam Load Cell (LSB200) or Miniature S Beam Load Cell with Male Thread (LRM200) paired with Instrumentation (IHH500).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
Rotary Hex Drive Torque Sensor (TRH Series) paired with Instrumentation (USB Solutions, IPM650 Digital Display, or IHH500 Handheld).

APPLICATION SUMMARY
Rotary Hex Drive Torque Sensors are typically used to verify screw spindles and torque measurements of power driven tools.

Sensor Solution Source
Load Cells · Pressure Sensors · Torque Sensors · Instruments · Software
APPLICATION SUMMARY
Utilizing FUTEK’s Smart Screwdriver Reaction Torque Sensor allows operators the ability to monitor the torque applied during assembly.

PRODUCTS IN USE
One Miniature Reaction Torque Sensor (TAT200) paired with USB Solutions and SENSIT™ Test and Measurement Software or our IHH500 Handheld Display.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
Non-Contact Shaft-to-Shaft Rotary Torque Sensor paired with Instrumentation (IHH500, IPM650, and USB Solutions).

APPLICATION SUMMARY
Robotic systems are often used in industrial plants but in this example how a robotic arm is creatively used in sports endurance application. The robotic arm mimics the slap shot of a hockey player and with the assistance of rotary torque sensors. Engineers can measure the force exerted at the tip of the hockey stick on various hockey sticks over high cycle testing. Data can be collected and analyzed to optimize or verify the stick design.

PRODUCTS IN USE
One Reaction Torque Sensor (TDF Series) paired with Instrumentation (IPM650, IHH500 or USB Solution).

APPLICATION SUMMARY
Reaction Torque Sensors are frequently used as auditing tools. This application is utilizing FUTEK’s TDF Torque Sensor to verify the precision of a torque wrench.
APPLICATION SUMMARY
Reaction torque sensors are often used as auditing and monitoring tools. This application utilizes the TFF Series to measure the reaction torque required by an electric valve actuator/motor to operate a ball, plug, or butterfly valve.

PRODUCTS IN USE
FUTEK's Reaction Torque Flange-to-Flange Sensor (TFF Series) paired with instrumentation (IAA Series analog amplifiers, USB Solutions, and the IHH500 handheld display).

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Torque hinges, friction hinges, and position hinges are all synonyms for a type of hinge that allows two parts to rotate about one another when a load is applied. The hinge then returns to its original position when that load is removed due to its high torsional stiffness. Because of this property, they are used in everything, from cabinetry and car glove boxes to laptops and monitor stands. This wide range of uses requires that these hinges survive and very often exceed the lifetime of the product. To ensure this, fatigue and cycle testing must be performed to verify the hinge lifespan when integrated into the product.

PRODUCTS IN USE
FUTEK’s TFF400 Reaction Torque sensor paired with Instrumentation (USB220, IAA Amplifier). For more in-depth analysis of hinge performance, a TRS605 Rotary Torque Sensor with a built-in encoder paired with a USB520 can be used.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY

In certain applications, like managing constant tension while winding material onto a spool, it is necessary for the servo motor to generate a fixed amount of torque. Frictional loss and motor speed change necessitate the inclusion of a closed loop control system. To accomplish this, place a reaction torque sensor between the servo gearbox and its mounting location to measure the generated torque.

PRODUCTS IN USE

FUTEK’s TFF500 Reaction Torque Sensor with Thru Hole Center paired with an IAA Series Analog Amplifier.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
PRODUCTS IN USE
A Load Button Load Cell (LLB Series) and paired with FUTEK’s USB Solutions and SENSIT Test and Measurement Software.

APPLICATION SUMMARY
Multiple Load Button Load Cells are utilized to measure the tactile force produced by an industrial robot.
APPLICATION SUMMARY

FUTEK partnered with The Robot Studio, a specialist in biometric robotic hardware, to construct a fully functional humanoid robot. Over 60 of FUTEK’s LSB200 Miniature S-Beam Jr. Load Cells are in operation to monitor the robot’s movements.

PRODUCTS IN USE

60+ Miniature S-Beam Jr. Load Cells (LSB200) with USB Solutions and SENSIT™ Test and Measurement Software.

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.

Sensor Solution Source
Load · Torque · Pressure · Multi Axis · Calibration · Instruments · Software

APPLICATION SUMMARY
Robotic spot welders can vastly speed up the manufacturing process by automating welding of complex or hard to access assemblies. The robot must apply the same force to clamp the parts being welded to make a strong, complete weld. To ensure this, an LCB400 Rod End Load Cell is used in line with the tong’s actuator to measure clamping force during welding.

PRODUCTS IN USE
One LCB400 Rod End Load Cell paired with Instrumentation (IAA Series or IDA100)

All FUTEK application illustrations are strictly conceptual. Please contact us with questions.
APPLICATION SUMMARY
Versatile and adaptive robotic armatures have the benefit of increasing manufacturing productivity by automating and performing complex, repetitive tasks 24×7. These arms are often designed to be trainable or operate as a team as cooperative robots (cobot/co-robot). Driving these arms in their joints are servo or stepper motors. In addition to monitoring shaft position, these arms need to monitor torque output for smooth, steady motion. By combining these motors with a reaction torque sensor, control loops can be developed for smooth, autonomous operation.

PRODUCTS IN USE
1 FUTEK TFF Series Reaction Torque Sensor paired with FUTEK Amplifiers (IAA Series or IDA100).

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