# Recent Applications

TorqSense transducers from Sensor Technology are playing a key role in the development of commercial-scale in-stream tidal turbines produced by Irish company, OpenHydro. They are being used to test the bearings, and this involves the use of a simulator that allows the company's engineers to determine how frictional forces in the bearings vary with different loads and rotational speeds. Central to the operation of this simulator is the measurement of torque in a shaft from the motor that drives the bearing under test. OpenHydro uses the RWT321 sensor in conjunction with Sensor Technology's TorqView software. This offers a choice of dial, digital bar and chart graph format display for torque, RPM, temperature and power. It also provides facilities for realtime plotting and for data recording, and can output stored results as files that are compatible with Matlab and Excel.

A TorqSense torque sensor is helping Powertrain Technologies reduce engine emissions and improve economy as part of a project to develop an intelligent lubrication system. The engine being tested was a current production Diesel and the test bed was configured for motored friction tests with a 6,000rpm 32kW electric motor driving the engine. The engine lubrication system was re-designed with a bank of five computer controlled oil pumps, each capable of supplying individual parts of the engine with oil under conditions unique to that part of the engine and sensitive to the engine operating conditions. The torque sensor is critical to the project since the object of the exercise is to measure the effect on friction of a range of different oil supply strategies and oil types. Thus the changes in friction are represented by a change in the motored drive torque of the engine.
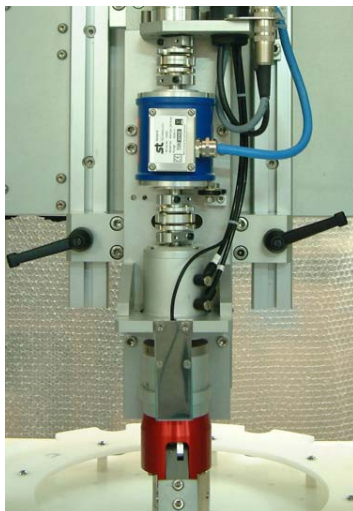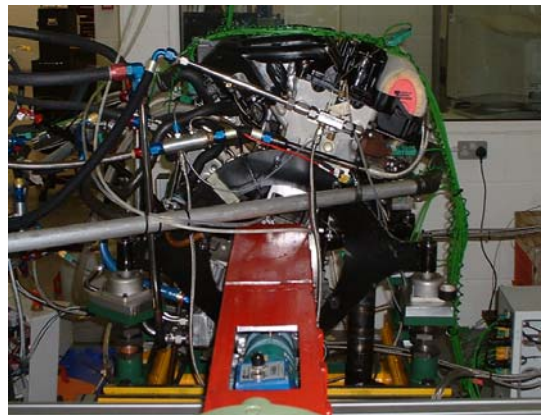
In the world of pharmaceuticals product integrity is paramount and packaging has a key role to play. CapCoder of Oxford use TorqSense transducers at the core of its specialist bottle sealing machines. These capping machines not only tighten bottle caps within precisely defined tolerance but also log every detail of every bottle that is capped. A batch size is typically 10,000 bottles, which are capped at a rate of one per second. Every cap has to be done up to the same torque, and proof of this performance is required. The machine had to run the torque up to 10kgf.cm within tolerances of 10% recording the actual value achieved. This secures the cap at a level of tightness that will ensure security and sterility, yet can be opened relatively easily by an adult. The logged values are saved using TorqView software to provide a permanent record for traceability.

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The new wireless LoadSense load cell provides all the information needed to optimise efficiency and increase profitability of a wide range of industrial operations. The new development allows weighing processes to be fully integrated with handling operations. All live data is captured in real time and can be transferred to a database, stored, totalised and analysed. The load sensor can be integrated with a crane hook, fork lift or other handling device. It has an on-board single-chip computer for recording, analysing and archiving readings, and wireless communications (operating on a harmonized global 2.4 GHz waveband) that can transfer data in real time to a host computer. Internal batteries make LoadSense's operation completely autonomous. As such it can be deployed with minimal disruption to operations, and will automatically begin transmitting data. No special training is required to install or operate the unit. Multi channel operation is standard.

Highway engineers and horticulturalists are using LoadSense wireless load cells to solve a critical safety problem, tree viability. Trees can transform a roadside verge, townscape or recreation space with their beauty and their ability to capture carbon dioxide. But they also present a potential hazard: if they fall, they could block a vital highway or even kill someone. As a result, professionals responsible for trees like to test the strength of their roots, usually by fixing a sling around the trunk and giving it a good tug with a tractor! A LoadSense transducer is put in line with the sling, and a wireless transmitter sends the live data to a nearby ruggedised PC or custom built handheld readout. The procedure is to pull the tree until the first suggestions of movement, with the load force being automatically displayed as a pass/fail signal.

LoadSense is helping theatres create breath-taking spectacles and leave the audience gasping for more, and ensure safety when excited performers and heavy machinery share the same space. This is achieved using real-time load signals from each winch. The data is monitored by a computer in the control room so that instant action can be taken if any loads move out of tolerance. For instance, if a load starts running too fast it can be slowed down immediately. If a prop is heavier than expected this could suggest someone was standing on it so shouldn't be whizzed 50 feet into the air at high speed. In fact, in this case, the computer 'jiggles' the load for a second or two as a warning to encourage the person to step away: If the load then returns to normal it can rise; if it doesn't, the floor manager is alerted by an alarm to check the situation.