

A sense of superiority

A high-performance, easy-to-use sensor that can instantly check the composition of fuels has resulted from University of Oxford physics research.



www.ox.ac.uk/oxfordimpacts

The use of biodiesel both as an additive to diesel and itself as a vehicle fuel is growing rapidly. Biodiesel is made from vegetable oils, animal fats, or recycled grease and, in addition to its environmentally friendly origins, produces lower concentrations of toxic emissions than normal diesel fuel. Biofuels are expected to meet at least a quarter of world demand for transportation fuels by 2050.

While the haulage industry may welcome this development, it needs to be certain that the biodiesel commonly added to diesel fuel throughout Europe is of an appropriate quality and percentage. Adulterated or contaminated fuels which fall outside the specification for a particular engine will damage it, but the identification and measurement of poor-quality fuels requires samples to be sent to a laboratory for analysis, which is both time-consuming and expensive.

Research led by Oxford physicist Professor John Gregg has created a technology that can tackle this problem. In trying to measure the properties of thin magnetic layered structures (used in solid state electronics devices), Professor Gregg and his research team developed a highly sensitive radiofrequency (RF) circuit which, it soon became apparent, could be put to a variety of innovative uses. In 2005 a spin-out company, Oxford RF Sensors, was set up to commercially exploit the patented technology.



The resulting range of sensors can be used to interrogate the composition of any liquid or solid. For the haulage and automotive industries, a robust battery-powered handheld fuel analyser can be used by an untrained operator to instantly check the composition of fuels being used in a vehicle or being blended for sale, without the need for time-consuming laboratory analysis. The sensors can also operate in hostile high-temperature and high-pressure conditions, where their ability to detect the presence and motion of a moving object is attracting great interest from the automotive and aerospace industries.

www.oxfordrfsensors.com

Funded by: The European Commission.