

Water-in-Fuel Sensor

Aston University researchers have invented a rapid and highly sensitive device for detecting and measuring water dissolved in liquid fuel. Aston's Business Partnership Unit is now actively seeking commercial partners to license this highly useful technology.

sensors. Other sensing systems measure changes in the refractive index of special optical fibre coatings to detect the amount of water dissolved in fuel. Each of these sensing systems tends to be highly complex and expensive.

Highlights

- Detects and measures water dissolved in liquid fuel
- Indicates the risk of “free water” or fuel-water emulsions forming in aircraft fuel tanks
- Rapid detection and high sensitivity (better than 10 ppm)

The Technology

Researchers at Aston University have invented a rapid and highly sensitive device for detecting minute levels of water dissolved in liquid fuel. The device uses an uncoated optical fibre probe fabricated from a permeable material that is highly sensitive to water. The presence of water therefore directly affects the optical properties of optical fibre in the probe. The device is sufficiently sensitive to monitor very small amounts of water dissolved in fuel (better than 10 ppm).

Background

Water is normally present in small amounts in liquid fuel, either dissolved in the fuel, in a separate liquid phase known as “free water”, or in a fuel-water emulsion. The existence of free water or a fuel-water emulsion can be dangerous, especially in the aerospace industry where frozen water poses a significant risk to aircraft, passengers and crew. It is therefore desirable to monitor the amount of water dissolved in fuel—to measure how close the fuel is to saturation—and to indicate the risk of free water or fuel-water emulsion formation.

A variety of sensing systems are currently used to measure existing free water or fuel-water emulsions, by measuring the resistive properties of free water, the dielectric properties of the emulsion, or differences in the refractive index of light propagating through multiple

Intellectual Property Protection

This technology is the subject of a UK patent application:

<i>Title</i>	<i>Patent Applications</i>	<i>Priority Claimed</i>	<i>Our Ref</i>
Sensor	GB 0915492.3	September 4, 2009	PAT-2009-024

Further Information

Further information can be made available and commercial discussions commenced on entering into a non-disclosure agreement.

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