



## 'Canary in a coal mine' sensor

Development of a prototype low-cost air quality sensor system

Academic: Dr David Birch

Fluid sensor researchers at Surrey have exploited the physical and electrical properties of gases to develop the low-cost 'Barozap' sensor, which can rapidly detect the presence of contaminants in a gas – paving the way for solutions in environmental monitoring and the diagnosis of lung disease.

While there are a number of gas concentration detectors on the market – usually tuned to specific gases and used in clusters – these tend to be fairly expensive and relatively slow, taking up to 30 seconds to respond. They are also unable to indicate the presence of a gas which is not being looked for. The Barozap, which uses high voltage to convert a sample of gas into plasma, and measures its electrical characteristics, can detect when a foreign gas or other contaminant is introduced into the air, and could be used in conjunction with existing sensors to give a more complete picture.

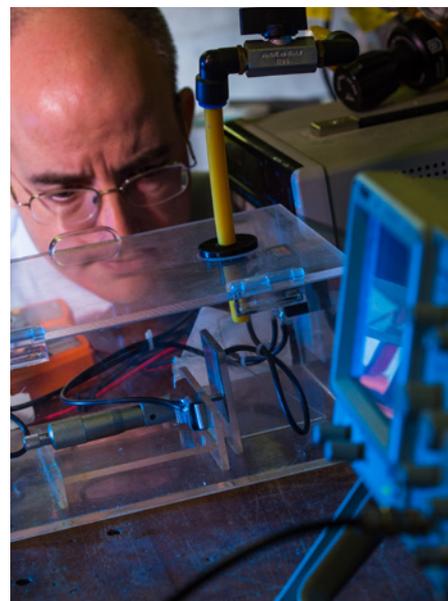
In the IAA project, which has been a collaboration between Surrey's Centre for Aerodynamics and Environmental Flow and University spin-out company Surrey Sensors Ltd, researchers have succeeded in demonstrating the sensor's ability to detect concentrations down to 100 parts per million in the air (which is comparable to existing process control equipment). In the near future, the team expects to reduce this to one part per million, while they also plan to miniaturise the system to the size of a whiteboard marker.

The Barozap sensor has already attracted interest from manufacturers of air quality sensing equipment and also the healthcare profession – where there is currently no simple technology to measure how gas exchange works within the lungs. Since it responds to the presence of contaminants almost instantly, the new sensor can tell doctors how well gas exchange is working within a patient's lungs during a single breath, and even during each part of each breath.

Joe Braitch, managing director of Surrey Sensors Ltd, says: "This much needed air quality monitoring system can detect a wide variety of air-borne threats, ringing alarm bells to alert watchers to investigate unexpected changes in the air we breathe. It's the modern equivalent of the 'canary in a coal mine'."

The project follows on from Dr Birch's previous IAA project to develop the 'sneezometer', a highly sensitive spirometer currently being trialled with SEHTA (the South East Health Technologies Alliance). He says: "This project is yet another example of innovative and valuable new technology

emerging from fundamental research, which could not possibly have been anticipated at the time we wrote the original proposal. The IAA grant provided that extra little push needed to turn the idea into a product, and get it out on the market."



Dr David Birch demonstrates the technology

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