

# Researchers develop revolutionary technology for manufacturing micro-scale devices

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(PhysOrg.com) -- Cranfield University has developed new technology that could significantly reduce the manufacturing costs of complex devices such as electronic noses that sniff out explosives and dangerous chemicals and gadgets that can diagnose disease.

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The project, part of a €3.2million research consortium entitled Q2M (Quality to Micro) supported by the European Union, addressed some of the key issues with existing micro-fabrication processes which are limited by the conflicting requirements of different materials.

"Standard micro-fabrication techniques are often incompatible with other high quality materials. This is one of the major bottlenecks for the development of novel micro-scale systems. The new technology will bring down the cost of genuinely new systems considerably," said Stephen Wilson, Senior Research Fellow in Microsystems Technology at Cranfield University.

The new methods can be used in the manufacture of a myriad of components and systems ranging in size from a few millimetres to a few 100s of nanometres. Applications include newly emerging technologies for personal healthcare such as biomedical devices that can diagnose

disease and electronically administer drugs and environmental control systems for personal healthcare. The technology also has the potential to open up new applications in communications as it offers the ability to incorporate previously incompatible non-silicon materials into radio-frequency circuits, thereby enhancing performance and capability.

In the same project Dr Paul Kirby collaborating with the IBM Research Centre in Zurich and the research establishment VTT in Finland, demonstrated that a 1 micron thick layer of piezoelectric material could be incorporated into radio-frequency micro-switches such as those found in mobile phone systems.

Dr Kirby said: "This is a significant achievement that could open up new application areas in high-speed telecommunications."

The Q2M Consortium, a three year Strategically Targeted Research Project (STREP) supported under the European Union 6th Framework project, comprised 12 academic partners and industrial companies engaged in technology development. The group also included a number of technology end-users to ensure the work addressed real industrial needs. The technologies developed through Q2M have subsequently been used to produce micro-valves, [silicon](#) micro-mirror arrays and radio frequency (RF) micro-components.

Provided by Cranfield University

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