

## **Title of Available Technology: Solution-Processed Flexible TiO<sub>2</sub> Memory Devices**

National Institute of Standards and Technology (NIST)

Dr. Jack E. Pevenstein, P.E.

Office of Technology Partnerships

Ph: 301-975-5519

Email: [jack.pevenstein@nist.gov](mailto:jack.pevenstein@nist.gov)

NIST scientists have designed and fabricated a novel electronic memory device that can be written, erased, and re-written on inexpensive flexible plastic substrates. Flexible electronics is an emerging industry with the potential to revolutionize inexpensive portable electronics. The NIST memory device combines simplified room temperature fabrication and non-volatile low operation voltage thus making it very promising for applications using flexible, rewritable memory.

One example of a possible application for the new device is a disposable sensor tape. A flexible strip containing sensors and electronics could be worn by a person to monitor things like heart rate or blood sugar. Vital information would be collected by the sensors, temporarily stored by the flexible memory then transferred to a long term storage device. Radio-frequency identification (RFID) solutions could likewise incorporate this memory platform into products to store inventory data.

NIST Scientists fabricated the flexible memory device using existing sol gel technologies and room-temperature solution processing techniques to create a two-terminal device using Titanium Dioxide as the memory element. This device shows a non-volatile memory behavior with on/off ratios up to 1,000:1, which can be cycled between write, read, and erase states by applying voltages with magnitudes of less than 10 Volts.

This technology could be used almost immediately in many widely diverse practical applications that require inexpensive, easily fabricated, reliable, limited use, low-voltage sensors. The potential application areas are impressively broad and include biomedical, food and agricultural safety, environmental monitoring, and battlefield protection of the individual soldier/public safety monitoring against exposure to chemical, biological and radiological agents, etc.

The technology is available immediately for licensing and commercialization.