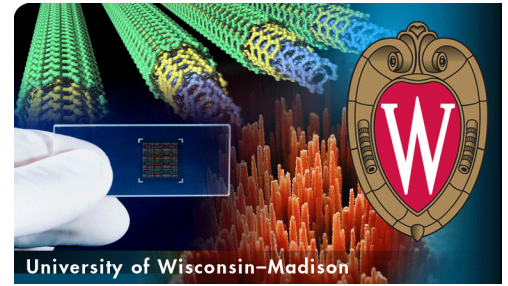


Micro-Electro-Discharge Machining Using Semiconductor Electrodes



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WARF: P02041US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing micromachined silicon electrode arrays for use in micro-electro-discharge machining of various materials, including metals.

OVERVIEW

Micro-electro-discharge machining (micro-EDM) is a micromachining technique well suited to cutting electrically conductive materials, such as steel, graphite or silicon. However, because it is a serial process involving a single wire electrode, conventional micro-EDM is slow, limiting its usefulness in high throughput applications. Use of a single electrode also hampers the technique's precision because the electrodes themselves are fabricated by another micro-EDM method that can cause variation in electrode shape.

THE INVENTION

UW-Madison researchers have developed micromachined silicon electrode arrays for use in micro-electro-discharge machining of various materials, including metals. An array of multiple electrodes is fabricated in a single-crystal silicon wafer by using wet or dry anisotropic etching, doped to provide electrical conductivity, and optionally metal-coated to increase both conductivity and wear resistance. The silicon electrode array is consumed during use and disposed of after a single application; however, the low cost of producing the array and its capacity to provide "cookie cutter" micromachining of many parts simultaneously makes this technology an efficient and low cost alternative to conventional, serial micro-EDM.

APPLICATIONS

- High throughput micromachining of electrically conductive materials

KEY BENEFITS

- Unlike conventional micro-EDM, silicon electrode arrays will facilitate efficient, high

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.



throughput micromachining of various materials, including metals.

- Batch, as opposed to serial, processing by silicon array micro-EDM allows more precise micromachining of multiple parts.
- Well suited to the micromachining of metals, such as brass, which are difficult to etch using standard lithography
- Arrays can be formed by conventional semiconductor techniques in high yield and at low cost.

ADDITIONAL INFORMATION

Tech Fields

Micro & Nanotech - Micromachining

CONTACT INFORMATION

For current licensing status, please contact Mark Staudt at mstaudt@warf.org or 608-960-9845.

