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FOR IMMEDIATE RELEASE

## **ISSYS Inc. Awarded New Patent for Wafer-Level Vacuum Packaging of MEMS Products**

Ypsilanti, MI August 27, 2003 --Integrated Sensing Systems, Inc. (ISSYS) announced that the U.S Patent Office has granted it a device and method patent (US 6,499,354) entitled "Methods for Prevention, Reduction, and Elimination of Outgassing and Trapped Gases in Micromachined Devices."

This patent is the underlying technology for long-term packaging of micromachined (aka MEMS; MicroElectroMechanical Systems) products in need of a vacuum package. The patented technology approaches the wafer-level vacuum packaging of MEMS devices in two ways: reduction of outgassing by a barrier layer and reduction of the generated gases by using a gas getter material. ISSYS has filed more patents to cover its subsequent invention, i.e., NanoGetters™ material, which builds upon this granted patent.

Many emerging MEMS products -- such as resonators, high-performance gyroscopes, RF devices, and tunneling sensors -- require vacuum packaging (<1 mTorr) for either their operation or for providing a higher level of performance. Two major problems encountered with existing wafer-to-wafer vacuum bonding techniques are (1) relatively high initial cavity pressures (despite bonding in a vacuum chamber) and (2) the cavity pressure change with time and temperature (drift). While the pressure of the vacuum wafer bonding system can get down to the microTorr level, ultimately surface desorption and outgassing after sealing limits the cavity pressure to above 1 Torr.

A total solution for this problem is introduced that satisfies all the requirements of both the device and its manufacturing. Dr. Douglas Sparks, ISSYS Executive VP of Operation, stated "Necessity is mother of invention! Integrated Sensing Systems Inc. (ISSYS) developed this manufacturing-friendly technology for the commercialization of its fluid products based on resonating micro-tubes." ISSYS ([www.mems-issys.com](http://www.mems-issys.com)) now offers this technology as a service to all the interested parties at a low cost. The core of this novel manufacturing technology is the proprietary vacuum gettering product called Nanogetters™. This gettering technology and its products are now commercially available by a spin-off company: Nanogetters Inc. ([www.nanogetters.com](http://www.nanogetters.com)).

At the system level perspective, one of the most attractive features that ISSYS and Nanogetters offer to the MEMS community is a "Total Solution" including:

- High-vacuum (< 1mTorr) encapsulation
- Long-term vacuum stability
- Hermetic electrical lead transfer
- Compatibility with all MEMS technologies (polysilicon surface, bulk, silicon-on glass, and LIGA micromachining technologies)
- Wafer-level fabrication (e.g., inclusion and activation of Nanogetter™, and hermetic sealing)
- Particle free Nanogetter™
- Low Activation Temperature for Nanogetter™
- High yield
- Low cost

**Company Background:**

ISSYS is a leader in advanced micromachining technologies for medical devices, microfluidic and analytical sensing applications used in the development of drug infusion pumps and wireless, implantable sensing systems. Founded in 1995 by three world recognized leaders in MEMS technology, ISSYS operates an “everything under one roof” multi-million-dollar, state-of-the-art MEMS fabrication facilities located in Ypsilanti, Michigan.

For more company product and service information, please visit <http://www.mems-issys.com/> and <http://www.nanogetters.com/>

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