

CAPABILITY STATEMENT



**Sensor
Development
Corporation**

www.sensordevelopmentcorp.com

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Core Competencies

SDC produces nano-crystalline tin oxide particles by sol-gel methods, fabricates sensor chips by microfabrication and thick-film techniques, assesses the semiconductor film properties by optical and analytical methods, and evaluates sensor performance using a custom computerized testing apparatus. Specifically, SDC's technology platform includes: 1) making alumina chips with a platinum heater trace on one side and extended, interdigitated platinum contact traces on the other, the traces terminating in gold alloy connection pads; 2) producing water-based tin oxide gels by a sol-gel process; 3) doping transition metal catalysts into the gels to enhance response to various volatile organic compounds (VOCs); 4) spin-coating the tin oxide gels uniformly onto the alumina chips; 5) drying/calcining the gel to produce a nanocrystalline semiconductor layer... the layer's resistance changes when reducing (electron-donating) gas phase VOCs contact its porous, high area surface; 6) wire-bonding to connect the chip to a holder, suspending the chip to achieve thermal isolation while allowing connection to electronics that controls its operation and processes the chip's signal. SDC developed methods for making sol-gels containing any one of a number of catalysts. These catalysts enhance the chip's response to specific gases, enabling selective detection of gas markers of different bio processes. This technology platform has been developed by SDC and it has been demonstrated as a way to detect VOC markers for molds and insects in stored grain and fungus infections in human lungs. This platform forms the basis for many different products by redesigning the chips to suit particular VOCs and by making associated software changes.

Past Performance

A New Nano-based detector for the Indianmeal Moth, Both Adult insects and Larva, Phase II USDA \$600,000

Monitor and Control the Formosan Subterranean Termite in Forest Resources, Phase I USDA, 2011-00246, \$99,809,

Detect the Lesser Grain Borer in Stored Grain Using an Application of a New Science and Technology, Phase I, USDA, \$99,755

Detect the Lesser Grain Borer in Stored Grain Using an Application of a New Science and Technology, Phase II, USDA \$449,852

Point and Click Low Cost Mold and Insect Detector, Phase I, Bill and Melinda Gates Foundation, \$100,000

Stored Product Protection with a Pheromone Based Multi - Insect Detector, Phase I, USDA, \$99,916

Differentiators

- Current methods of insect detection are expensive, cumbersome and imprecise, and rely on flashlight inspection and the use of traps with multiple synthetic pheromone lures to capture adult stored product insects.
- SDC's sensor detects and characterizes insect infestation in real-time for adult Indian mealmoths and the Indian mealmoth larvae.
- SDC's technology can detect and measure pheromone concentrations and relate them to insect counts. Much quicker detection should be possible as the level of detection of pheromone is in the ppb range.
- No physical sampling or insect classification by a person is required, a great improvement over all existing products. This approach affords significant savings in time and costs over current testing procedures.
- The technology is applied to detecting both the adult moth and the food consuming larval stages of the infestation – a first.

Company Data

The Company, Sensor Development Corporation, an Ohio Corporation was founded in February of 2003, by a group of dedicated scientists and engineers with a combined 60 years of R&D experience. The company's primary focus is placed on the development of volatile organic compound sensors for a variety of niche markets such as insect detection in stored products, mycotoxin detection for stored cereal products, and breath analysis for early detection of pulmonary fungal infections. The company has grown to 5 employees. The original sensor research was performed at Case Western Reserve University. Mr. Smilanich was an industrial advisory board member to Prof. C.C. Liu, an internationally recognized sensor expert, and Prof. Liu continues the relationship as a member of DC's Technical Advisory Board.

Pertinent Codes

- DUNS Number: 010131238
- NAICS: Small Business
- Cage Code: 42LL2