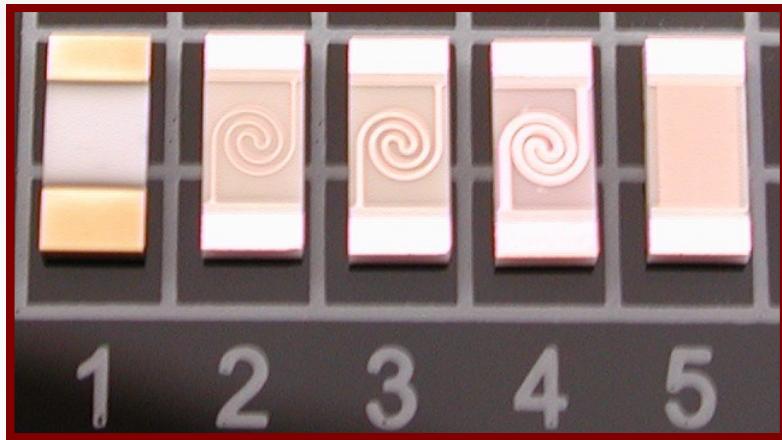




TECHNOLOGY SUMMARY

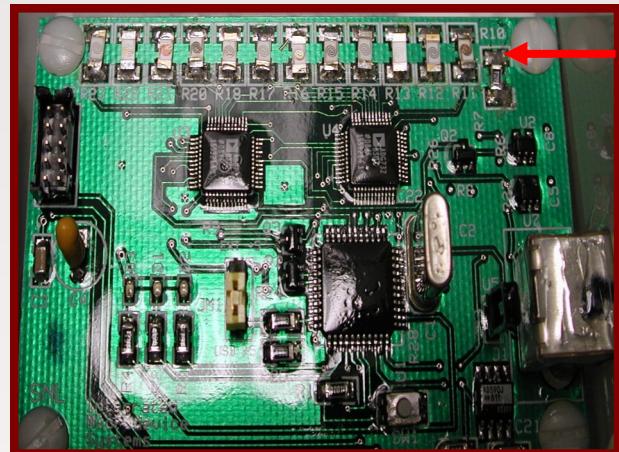
Sandia National Laboratories has created sensors to identify and assess the pervasive and expensive problem of corrosion in applications ranging from construction to microelectronics. Sandia's micro sensors are designed and fabricated in the style of standard surface mount components (such as resistors and capacitors), which can be soldered directly onto networks such as printed circuit boards (PCBs). This allows easy integration with support electronics via standard assembly processes in a very small footprint. Corrosive environments passively and proportionately modify a sensor's response over time allowing periodic interrogation to provide information on the enclosed systems. Sensors can be packaged with a high density for redundancy, designed for a wide range of sensitivity, and strategically located for multiple sensing tasks. The sensors are produced by the hundreds per wafer using standard industry methods resulting in low per unit costs. To date, sensors have been designed for corrosion assessment of copper, aluminum and wire bonded chips. Many other interrogation systems are possible.



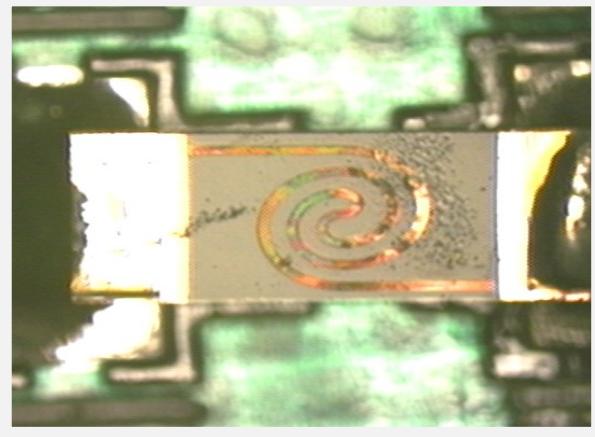
PC-mount corrosion sensors of various serpentine widths. Capacitive sensor shown on far right.

Sensor substrate can be ceramic, silicon, or any other network medium compatible with microfabrication processes.

US PATENT PENDING



A line of corrosion sensors of various widths and thicknesses soldered to a PC board.



Sensor after exposure to corrosive environment.

Practical sensor dimensions range from 0.010" x 0.010" to 0.5" x 0.5".



POTENTIAL APPLICATIONS

| | |
|------------------------------|---------------------------------|
| Building Ventilation Systems | Architectural Structures |
| First Responder Respirators | Automotive Systems |
| Household Electronics | Space Systems |
| High Consequence Systems | Environmental Change Indicators |
| Water Monitoring Systems | Remote-based Systems |

TECHNOLOGY BENEFITS

- Accumulates corrosion effects passively: power needed only when interrogating
- Designed and fabricated in the style of standard surface mount components which can be directly soldered onto networks such as printed circuit boards (PCBs)
- Sensors can be packaged with a high density for redundancy, designed for a wide range of sensitivity and strategically located for multiple sensing tasks
- Produced using standard industry methods
- Low per unit cost—600 sensors from a single 4" wafer

TECHNOLOGY READINESS LEVEL

Sandia estimates this technology to have a technology readiness level of 6-7. Key elements of this technology have been demonstrated in representative configurations in high fidelity laboratory controlled environments.

CONTACT INFORMATION

For more information or to discuss licensing opportunities please contact us at

ip@sandia.gov

Refer to SD # 11831

Sign up for email updates at

<https://ip.sandia.gov>

