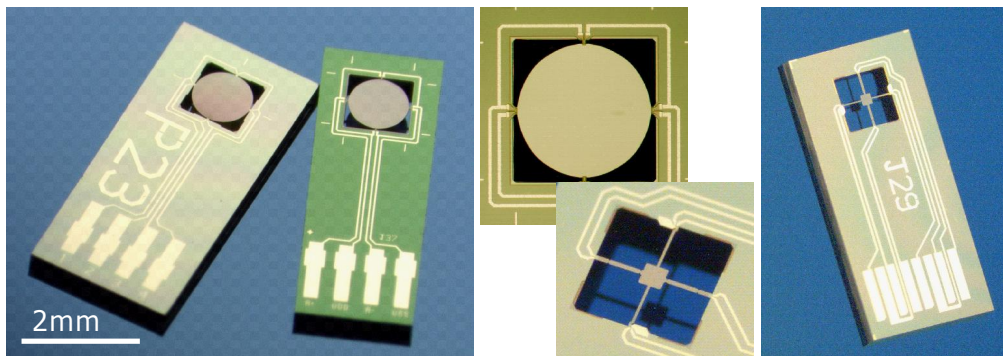


Membrane-type Surface-stress Sensor (MSS)



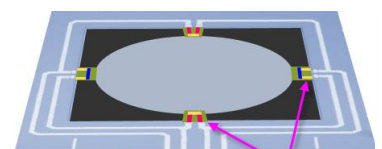
Applications

- Electronic nose
- Gas/odor sensing
- Nanomechanical sensing
- Torque magnetometry
- Force sensing
- etc.

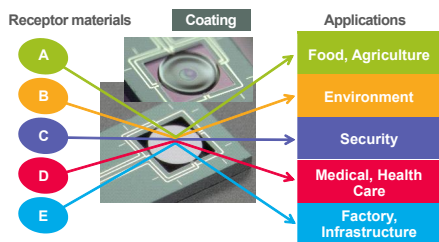


■ **What is the MSS?** The MSS is a non-packaged MEMS sensor, a silicon membrane platform supported with four beams on which piezoresistors are embedded.

■ **Two major applications:** (i) The MSS has a great potential as a core component for electronic (artificial) nose systems utilized in *e.g.*, medical, food, environment, safety and security fields. (ii) The MSS can also be used for assessment of various materials like organic conductors, magnetic and superconductor materials in torque magnetometry.

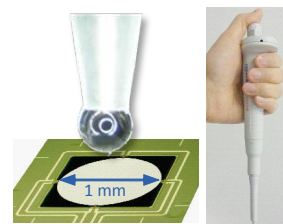
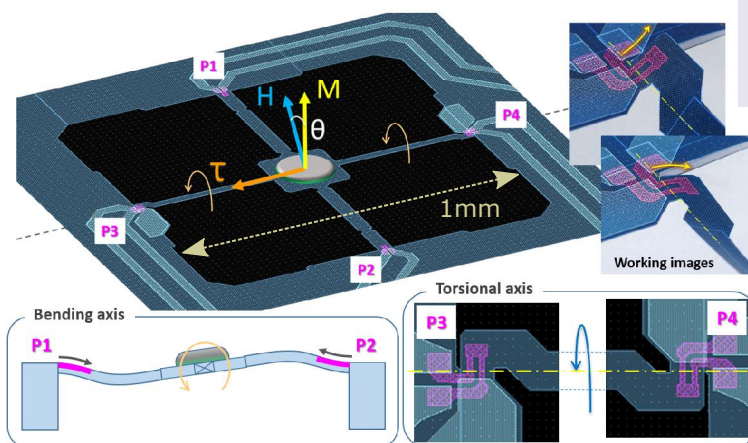
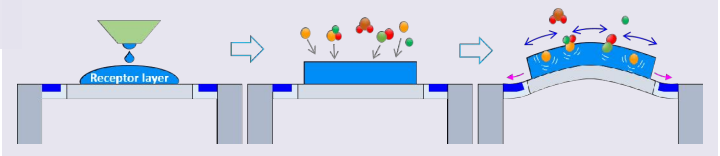


Piezoresistors



Researchers can coat the membranes with a coating of their choice

■ **How to apply the MSS for gas/odor sensing:** Initially, the membrane is coated with a receptor layer sensitive to *e.g.*, volatile organic compounds (VOCs), which determines the sensitivity and the specificity of the individual sensor. The coating is done with *e.g.*, inkjet spotter, spray coater, or manually with micropipette. Upon absorbing VOCs, the receptor layer yields surface stress and deforms the membrane, which induces resistance changes of the piezoresistors. By monitoring the changes, the presence of the target gas/odor molecules is detected.



Manual coating feasibility



Fits to commercial connectors

■ Torque magnetometry, force sensing:

SD-MSS-1KTM is specially designed for those applications. The sensing beams are long and form "bending" and "torsional" axes. Each piezoresistors can individually addressed. Users can test various measurement configurations.

Product code	SD - MSS - 1K	SD - MSS - 1K2G	SD - MSS - 1KTM
Membranesize [μm]	1000 round		200 square
Membrane thickness [μm]	5.2 (typical)		2.8 (typical)
Chip dimensions [mm]	5.5 x 2.0 x 0.3		5.5 x 2.5 x 0.3
Resistance value [kΩ]	2 – 15		0.3 – 1.2
Electric configuration	Full bridge, 4 pads, 0.5 mm pitch		Separated, 8 pads, 0.25 (0.5) mm pitch
Coating	No		