

Fig.1 Schematic cross-sectional view of sapphire-based capacitive pressure sensor of conventional pressure ranges

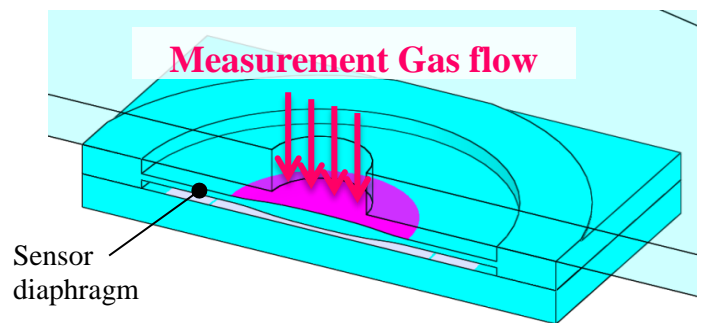


Fig.2 Schematic cross-sectional view of conventional structure around the sensor chip with local thermal expansion of the sensor diaphragm caused by gas flow

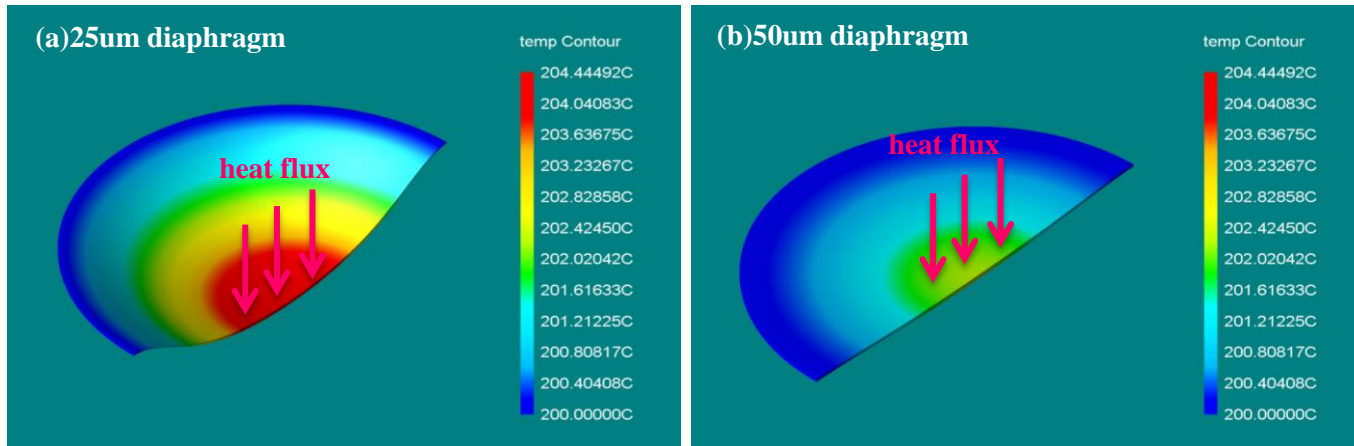


Fig.3 Result of the one of thermal simulation

In spite of applying same amount of heat flux on the center part of diaphragm surface, temperature increasing and deformation of thinner diaphragm (a) are larger than that of thicker diaphragm (b).

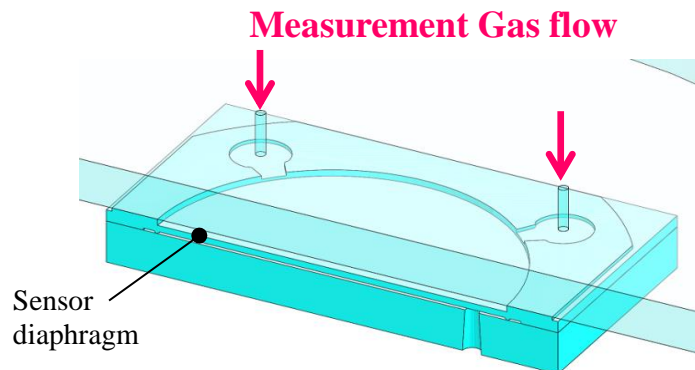
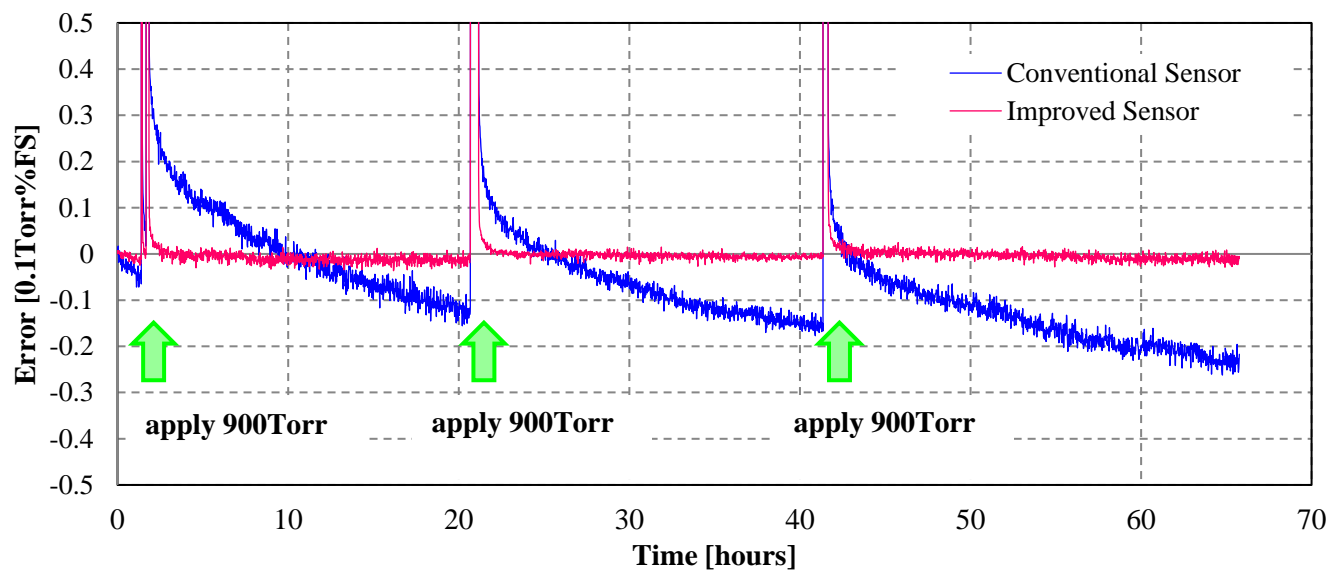


Fig.4 Schematic cross-sectional view of improved structure around the sensor chip

In improved sensor structure, measurement gas can be exchange thermal energy with sensor chip before arriving to the diaphragm.



Graph.1 Zero point drift of conventional and improved sensor before and after applying 900Torr for 5min at 200 degreeC (background pressure is under 1e-6Torr)

Though zero point drift which did not stabilize even after 24 hours was observed in conventional sensor after applying pressure, the improved sensor converged to zero quickly.