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Abstract

Ultra-Low Power MEMS Gas Sensor Technology and Application †

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The semiconductor type sensor developed by New Cosmos is a very unique sensor depending on its principle and structure. This sensor is called a hot wire type semiconductor sensor (CH). By integrating the detection element and the heater, the two terminals have a simple structure. Therefore, it is excellent in mass production. The resistance is as low as several ohms, and it has high sensitivity and brings about large output change.

The biggest disadvantage of this sensor was its high power consumption. It was not suitable for battery operation. In 2012, we succeeded in miniaturizing the CH sensor using the MEMS technology, and completed the Ultra-Low power MEMS CH sensor (MCH) (Figure 1).

In the U.S., urban gas piping infrastructure is deteriorating due to age and environmental factors. There is a growing need to monitor this aging infrastructure to prevent dangerous explosion risks. Many of the locations where monitoring is required do not have electricity to power a traditional gas detector. The ultra-low power MEMS sensor technology is enabling utility companies to install these products in places where they previously could not be installed. This is enhancing public safety.

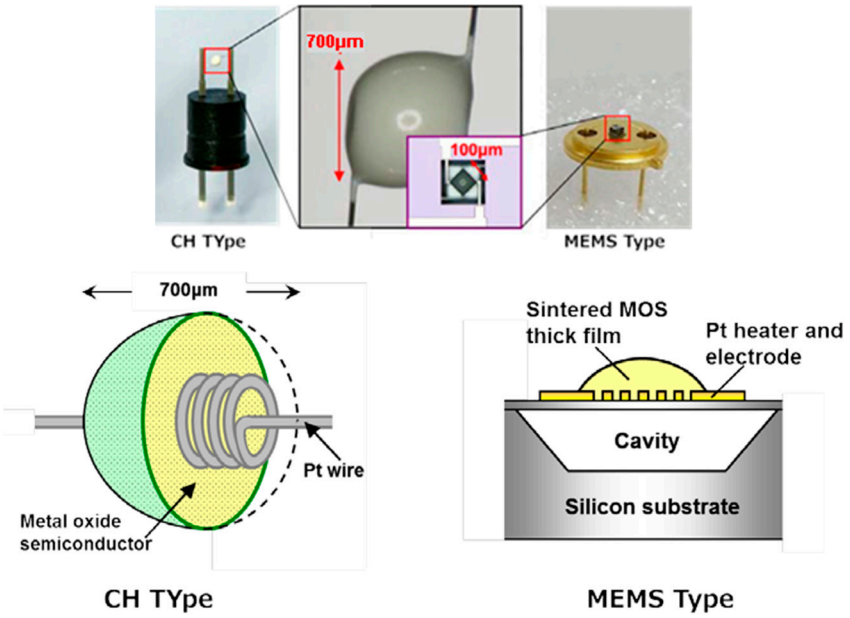

Figure 1. Structual drawing CH & MEMS TYPE.

Until now, it was not possible to monitor gas leaks in areas without AC power. The MEMS technology has allowed for a battery powered methane detector, and it is now possible to monitor for gas leak hazards in more locations. Additionally, the wireless technology notifies authorities of emergencies immediately. This product (Figure 2) is currently being installed in New York City, and has already detected several potentially dangerous leaks. This has enhanced the safety of the residents of New York City and is helping New Cosmos achieve our goal of eliminating injury and property damage due to gas accidents in the world.

- 5 year sensor life
- 5 year battery life
- GTI tested for nuisance alarm immunity
- UL1484 certified and FCC certified
- Alarms at methane concentration of 10% LEL
- Provides 85 dB audible alarm
- Communicates through wireless mesh network
- First of its kind device worldwide.

Figure 2. Final Product.