

Many oxygen sensors have cross sensitivity issues associated with them therefore it is important to know the root cause of the cross sensitivity in order to avoid environments that may pollute your zirconia dioxide oxygen sensor.

There are specific gases and chemicals that have a negative influence on [SST's Zirconia Dioxide Oxygen Sensors](#), particularly on the life of the sensors or on the performance results. In this article, it will detail what gases and chemicals to avoid when using [SST's Zirconia Dioxide Oxygen Sensors](#).

Combustible Gases

Small amounts of combustible gases will be burned at the hot Pt-electrode surfaces or Al_2O_3 filters of the sensor. In general, combustion will be stoichiometric as long as enough oxygen is available, the sensor will measure the residual oxygen pressure which leads to a measurement error. The sensor is not recommended for use in applications where there are large amounts of combustible gases present and an accurate oxygen measurement is required. Gases investigated by SST are as follows;

- H_2 (Hydrogen) up to 2%; stoichiometric combustion
- CO (Carbon Monoxide) up to 2%; stoichiometric combustion
- CH_4 (Methane) up to 2.5%; stoichiometric combustion
- NH_3 (Ammonia) up to 1500ppm; stoichiometric combustion

Heavy Metals

Vapours from metals such as Zn (Zinc), Cd (Cadmium), Pb (Lead), Bi (Bismuth) will have an effect on the catalytic properties of the Pt-electrodes. Exposing the Zirconia Dioxide Oxygen Sensors to these metal vapours must be avoided.

Halogen and Sulphur Compounds

Small amounts (<100ppm) of Halogens and/or Sulphur compounds have no effect on the performance of the [zirconia dioxide oxygen sensors](#). Higher amounts of these gases will, in time, cause readout problems or, especially in condensing environments, corrosion of sensor parts. Gases investigated by SST are listed below;

- Halogens, F_2 (Fluorine), Cl_2 (Chlorine)
- HCL (Hydrogen Chloride), HF (Hydrogen Fluoride)
- SO_2 (Sulphur Dioxide)

- H_2S (Hydrogen Sulphide)
- Freon gases
- CS_2 (Carbon Disulfide)

Reducing Atmospheres

Long time exposure to reducing atmospheres may in time impair the catalytic effect of the Pt-electrodes and must be avoided. Reducing atmospheres are defined as an atmosphere with very little free oxygen and where combustible gases are present. In this type of atmosphere oxygen is consumed as the combustible gases are burned.

Other

Many customers get [SST's Zirconia Dioxide Oxygen Sensors](#) confused with Bosch Lambda oxygen sensors that are mainly used in automotive combustion applications. SST's oxygen sensors were developed for boiler combustion control applications. Life tests have been performed in;

- A laboratory atmosphere
- Exhaust gases of natural gas fired boilers
- Exhaust gases of light oil

In summary, [SST's Zirconia Dioxide Oxygen Sensors](#) have cross sensitivity when particular gases, substances and chemicals are present within the atmosphere. In order to get the maximum performance and prolonged lifetime from the zirconia dioxide oxygen sensors, take into consideration all of the information covered in this article.

Please note, these are all the gases, chemicals and substances SST have performed tests in, if the gas that is present within your application environment is not on the list above, we would recommend testing the sensor for a period of time to ensure it works to its maximum potential.