

Press Information

High-performance ceramic for oxygen measurements

Kyocera's subsidiary, Kyocera Fineceramics Solutions GmbH, formerly part of Friatec GmbH, develops robust oxygen sensors for managing combustion in industrial processes.

Kyoto/London, December 2nd, 2019. The ceramics division of Friatec GmbH, which was integrated into Kyocera Fineceramics Solutions GmbH after the acquisition, is known for its high-performance ceramic components for a wide application range. With DEGUSSIT FZY, it has an innovative material at its disposal for measuring oxygen at high temperatures.

Leading manufacturers of gas analysers and measurement systems such as Zirox Sensoren und Elektronik GmbH have relied on the quality of this technology for many years.

Precise measurement of oxygen content

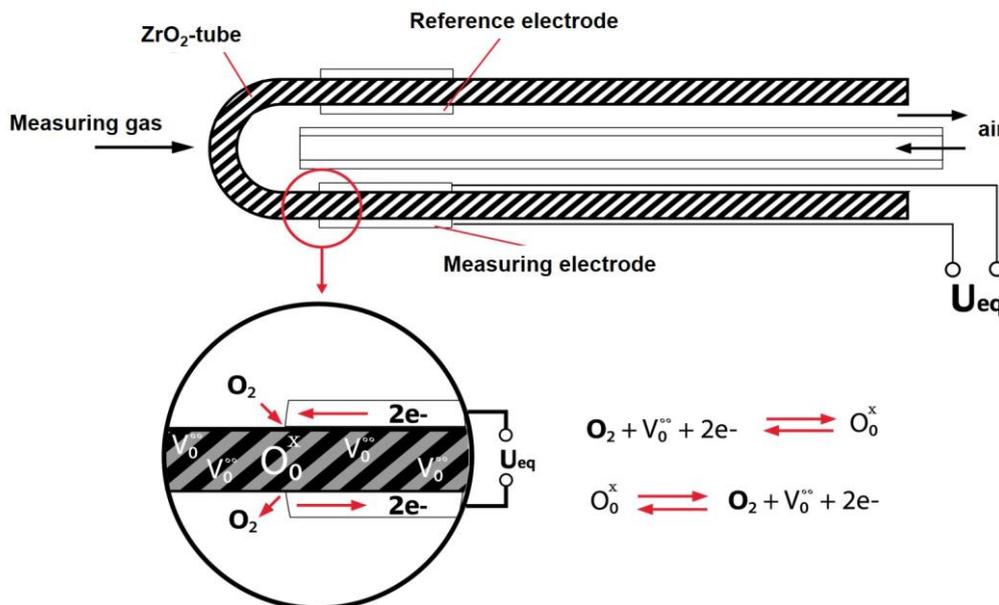
It is essential to know the level of oxygen of a gas or be able to prove its presence in various industrial processes. Measuring the level of oxygen at high temperatures and under difficult conditions, such as when subject to chemical or mechanical influences, is only possible by utilising so-called solid-state electrolytes. One such material, DEGUSSIT FZY, a ceramic solid-state electrolyte comprising an yttria partially-stabilised zirconia, particularly stands out due to its resistance to temperature changes and corrosion. It can be used at temperatures up to 1,500 °C. Depending on the heating of the sensors, they can be installed directly into the high-temperature process or even outside of this process. Response times are also very short with a constant measurement signal.

Wide application range regarding industrial processes

Due to the material's durability, sensors with DEGUSSIT FZY are particularly suitable for managing combustion processes, such as those commonly found in gas-fired industrial ovens, combustion engines, and power stations. In order to ensure a smooth operation and an efficient use of resources in these processes, the air or level of oxygen must be precisely configured. The applications of sensors with DEGUSSIT FZY therefore range from annealing processes to shielding gas monitoring and surface treatments (hardening plants) to Redox reactions and diffusion processes. The product is also used in biotechnical processes as well as for controlling food packaging. One prerequisite for the various possible uses is the variety of products in which oxygen sensors are available: products made of DEGUSSIT FZY include single-ended or double-ended tubes, sheets, crucibles, H-sleeves, spheres, and moulded parts.

How the solid-state electrolyte sensors work

Yttria (Y_2O_3) partially-stabilised zirconia is a conductor of oxygen ions at temperatures above 600 °C. Solid-state electrolyte sensors with FRIALIT®-DEGUSSIT® ceramic make use of this property. The zirconia ceramic acts as a gas-proof separating layer between two gases with differing oxygen concentrations. Various chemical potentials arise when electron conductors are on both sides, as is the case with a layer of platinum, for example. As a result, the electrical tension between the two electrodes can be measured. The tension depends on the difference in the oxygen concentration of both gases. Air is often used as a reference gas.



Schematic diagram of Zirox

About Zirox Sensoren und Elektronik GmbH

Zirox is a medium-sized company based in Greifswald, which was founded in 1989 and is now one of the leading manufacturers of gas analysers and measurement systems, offering around 750 product variants as well as custom solutions and products. The company develops and manufactures its products exclusively in Germany and has relied for a number of years on the quality of the DEGUSSIT FZY tubes produced by Kyocera Fineceramics Solutions GmbH. Zirox has established an international presence with its technologies and is particularly active on the Asian market.



For more information on Kyocera: www.kyocera.co.uk

About Kyocera

Headquartered in Kyoto, Japan, Kyocera Corporation is one of the world's leading manufacturers of fine ceramic components for the technology industry. The strategically important divisions in the Kyocera Group, which is comprised of 286 subsidiaries (as of March 31, 2019), are information and communications technologies, products which increase quality of life, and environmentally friendly products. The technology group is also one of the most experienced producers of solar energy systems worldwide, with more than 40 years of know-how in the industry.

The company is ranked #655 on Forbes magazine's 2019 "Global 2000" listing of the world's largest publicly traded companies. With a global workforce of over 77,000 employees, Kyocera posted net sales of approximately €12,99 million in fiscal year 2018/2019. The products marketed by the company in Europe include printers, digital copying systems, semiconductor-, fine ceramic-, automotive- and electronic components as well as printing devices and kitchen products. The Kyocera Group has two independent companies in the United Kingdom: Kyocera Fineceramics Ltd. and Kyocera Document Solutions.

The company also takes an active interest in cultural affairs. The Kyoto Prize, a prominent international award, is presented each year by the Inamori Foundation — established by Kyocera founder Dr. Kazuo Inamori — to individuals and groups worldwide who have contributed significantly to the scientific, cultural, and spiritual betterment of humankind (converted at approximately €828,000 per prize category).

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