

Using zirconium oxide oxygen probes for potters

Zirconium oxide oxygen probes are an invaluable tool for potters wishing to control and optimize firing processes in their kilns. These probes enable precise measurement of the oxygen level in the kiln atmosphere, which is essential for controlling the reduction and oxidation (redox) reactions that directly influence the appearance and quality of ceramic parts.

1. Operating principle

Oxygen probes work like an "electronic nose" for the oven. They use a special material that reacts to heat and measures the amount of oxygen present in the air. By comparing the kiln interior with an external reference (reference air supplied by a small hand pump), they give a precise indication of the oxygen level. This helps the potter to adjust firing conditions as required.

2. Description of Econox CarboProbe CP probe

The **CarboProbe CP** is a compact, versatile oxygen probe designed by Econox for potters wishing to make precise, reliable oxygen measurements in their kilns. It features a **zirconium oxide sensor** for fast, accurate measurement of oxygen concentration. Its **robust construction**, thanks to pure platinum electrodes, guarantees enhanced resistance to corrosion. Compact and lightweight, it integrates easily into all types of potters' kilns, combining reliability with ease of installation and use.



- **Accuracy:** The probes enable precise, real-time measurement of oxygen in the furnace.
- **Process control:** They give potters greater control over firing conditions, reducing errors and unexpected variations.

- **Optimizing results:** Good management of reduction and oxidation atmospheres enhances the aesthetic quality of parts, especially the colors of glazes and engobes.
- **Energy savings:** By optimizing cooking cycles, probes help avoid unnecessary energy expenditure.
- **Firing documentation:** Collected data can be archived to reproduce accurate results for future firings.

3. Concrete example of reduction and oxidation

Imagine a potter who wants to create spectacular glaze effects on a series of stoneware vases. He uses a glaze containing iron oxides, which can produce a variety of colors depending on atmospheric conditions.

Oxidation phase

During the heating process, the potter maintains an oxygen-rich atmosphere. The probe indicates a high oxygen level, and the iron oxides remain in their oxidized state, producing red and brown hues on the glazes.

Reduction phase :

On reaching a high temperature, the potter reduces the air supply and introduces an additional fuel source (e.g. propane or wood) to create an oxygen-poor atmosphere. The probe signals a drastic reduction in oxygen. Under these conditions, iron oxides transform into their reduced states, producing blue, green or black colors.

By precisely controlling these phases with the probe, the potter achieves consistent, breathtaking results, while reducing the risk of defects.



Example of a potter's kiln in his workshop and the CarboProbe CP probe.

4. A smart investment for long-term savings

The acquisition of a zirconium oxide oxygen probe represents a strategic investment for potters. Although the initial cost may seem high, the long-term savings are substantial:

- **Reduced losses:** Fewer defective parts thanks to better control of firing conditions.
- **Energy optimization:** more efficient use of the furnace, reducing energy costs.
- **Improved quality:** Consistent, high-quality results increase customer satisfaction and the value of creations.

5. Conclusion

Zirconium oxide oxygen probes revolutionize the work of potters, enabling them to explore complex firing techniques with precision and confidence. Their use results in unique, high-quality creations, while offering greater energy efficiency and reduced waste. They are therefore an ideal investment for potters and ceramists seeking to perfect their craft.

By choosing this technology, potters are investing in a sustainable solution that improves their productivity while respecting their budget over the long term.

The **CarboProbe CP** is definitely a strategic choice for anyone looking for precise, reliable and durable solutions to control their baking process.

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