



*lance holder unit  
water cooled-lance  
insert core  
disposable oxygen sensor*

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## **Oxygen Sensor for Glass Melt**



***On-line Measurement in  
Industrial Glass Melting Furnaces***

Continuous monitoring of the glass melt ox



- Simple and robust construction
- Low investment costs
- Disposable ceramic sensor
- Excellent correlation between sensor signal and spectro-photometric iron ratio
- Providing new insight in the glass melting process

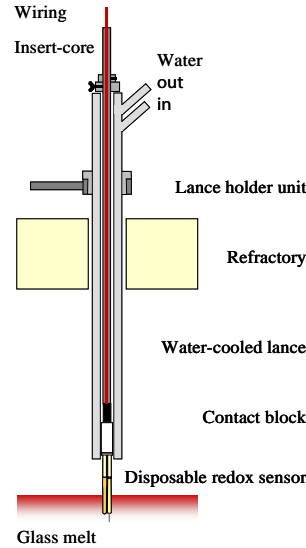
This oxygen measuring system has been developed especially for the on-line measurement of the oxygen activity of the glass melt in an industrial glass melting furnace.

In recent years it is more and more realized that the oxygen activity of the glass melt affects the efficiency of the industrial glass melting process. The glass melt sensor controls important process and product properties such as:

- \* Fining and foaming of the melt
- \* Radiant heat transfer (crown and bottom temperatures)
- \* Forming properties (cooling rate of gob and preform)
- \* Glass color and other optical properties
- \* Seed count

Using this sensor, the glass melting process will become more transparent to the furnace operator and will provide him valuable information for fast correction and finding the optimal production settings

Simple & Robust Construction



Freedom in the choice of the measuring location as a result of simple and robust construction, comprising a lance holder unit (1), a water cooled-lance (2), an insert core (3), and a small disposable redox sensor (4). Ideal for on-line measurement in feeder, working end or fore-hearth. The sensor is easily connected to the contact block on the insert-core. The water-cooled lance is positioned in the furnace so that the lower end is just above the glass melt level. This sensor extends partially out of the water-cooled lance with its measuring tip immersed in the glass melt.

Low investment costs

As a result of its simple construction and disposable concept, the costs of a complete measuring system is low. Apart from on-line monitoring for process control it is therefore also an ideal tool for process optimization programs or research projects, e.g. during a glass color change, batch component change or an increase of the recycling cullet share.

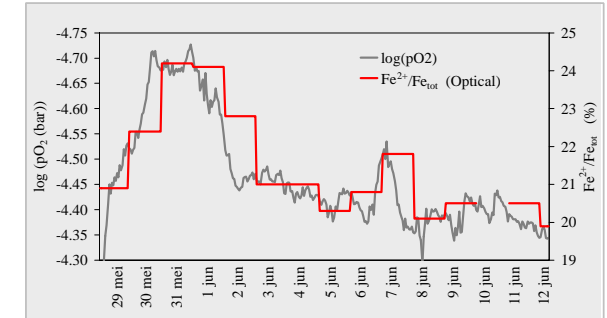
Disposable concept

The ceramic sensor has a limited lifetime, because it is partially immersed in the hot and corrosive glass melt. For this reason a disposable concept of sensor exchange after a certain operating time has been chosen. Using a water-cooled lance, the disposable sensor can be kept small and of a standard dimension, irrespective of the measuring location. This makes the measuring system flexible and relatively less expensive. Sensor lifetime depends on glass melt type and temperature. Lifetime indication: approximately 1 month at 1200 C in a container glass melt. The sensor can be ordered in sets of 5 or 10 sensors per box:



Excellent Correlation

An excellent correlation exists between the daily iron ratio measurement on the ready glass product and the sensor signal from the feeder channel of a green container glass furnace.



Providing new insight

Bottom temperatures in the melting tank (green container glass) correlate to the measured oxygen in the feeder. A batch carbon increase resulted in too low bottom temperatures causing high seed counts in the product. Subsequently, the carbon level was decrease again, resulting in a higher bottom temperature.

