



STG Lambda Control for cross-fired Glass melting furnaces, based on STG Oxygen sensors

Taking over control of ingress air

Ingress air which is not needed for combustion causes energy loss due to an increased waste gas flow and reduces energy efficiency.

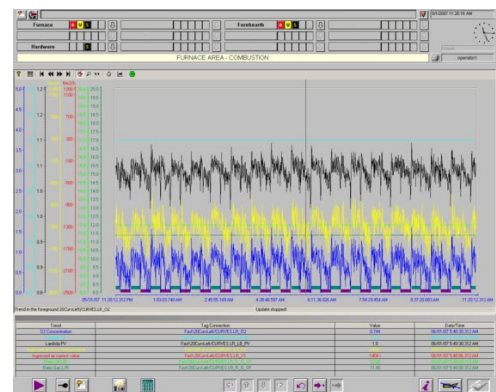
STG Oxygen sensors today are representing a wide spread standard in the German and European glass industry, with more than 200 applications worldwide. We expect a service life of 3-4 and more years (depending on design of regenerator and combustion conditions).

And a continuous growing number of melting furnaces meanwhile is operating more energy efficiently with Lambda Control based on STG sensors.

While ratio control of air and fuel controls only the input - the uncontrolled input of ingress air (as about 5...8% of total air) actually decides about energy efficiency and NO_x formation. Only Lambda control may provide you *real control of optimum combustion*, taking in account the feedback of combustion equipments.



STG Oxygen Sensors: the basis for Lambda Control. Installed in more than 200 furnaces worldwide



STG Lambda Control Screenshot of optimum solution: SIEMENS PCS7 integration

In response to meet requirements of NO_x and CO_2 reduction and energy saving, melting furnaces today are forced to operate using greatly reduced amounts of combustion air, even below stoichiometric ratio of air and fuel or even using excess reburn gases.

STG Oxygen sensors and STG Lambda signal processing are taking in account such trends, making possible a reliable measurement as well as the control of ingress air factor Lambda, even for extended low stoichiometric operations.

Lambda control – that means:

1. Measuring flue gas composition downstream just after furnace chamber and monitoring the actual volume of uncontrolled ingress air infiltration
2. Based on that to minimize air infiltration, which is always reason of energy losses and extended NO_x formation
3. To compensate changing ingress air infiltration by a modified ratio or delivery of a correction factor

Compatibility and scope of supply and performances:

Lambda Control Software originally was developed for and therefore is best proven with SIEMENS DCS. Naturally, out of our continuous grown STG Software Pool we have also available solutions for integration of signals with other DCS types – but it needs a good cooperation between STG, customer’s engineers and original programmers in order to make Lambda Control 100% compatible.

This is the typical Lambda Package for a 7–port crossfired furnace application:

- Oxygen sensors with accessories: 14x sensor, 14x heat resistant coupling, 14x heat protection funnel, 14x junction box
- 2x Reference Air Control Box, incl. pressure regulator, flowmeters for control of continuous supply of sensors with clean reference air, terminal strip for O₂ signal processing of sensors
- 14x50m sensor signal cables and reference air copper pipes for connection of sensors with reference air control box
- Lambda Hardware: SIMATIC PLC plus Touch Panel, either to install within control room or separate local box
- Lambda Software: STG Lambda software function block
- Installation and start up of sensors , Lambda Hardware, integration of Lambda Software into existing
- *Optional: making available STG Lambda Control for furnaces without partition walls by deflecting of uncontrolled combustion air flow with “STG Air Curtain System”*

