
CO sensing to control the combustion process

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Abstract

Reducing the energy consumption of glass melters is a crucial challenge for the glass industry. Most industrial furnaces are based on the combustion of fuels. Therefore, the oxygen/fuel ratio is the most important parameter to achieve complete combustion and optimized energy consumption. An oxygen excess leads to a reduction of thermal efficiency and promotes undesired NOx formation. Under-stoichiometric conditions lead to CO generation, higher evaporation, refractory corrosion, and glass quality issues. Oxygen probes are generally placed at the top of the regenerators to monitor the excess of oxygen in the process. These measurements are localized and may be disturbed by air leakages. An alternative way to monitor and optimize combustion settings consists in measuring CO with a laser-based sensor. CO is a reliable and more accurate indicator than oxygen for the completeness of the combustion process. CO can be readily correlated with the NOx emissions of the process. Laser-based technologies allow for measurements through the full width of the flue gas channel and as close to the combustion space as possible. The link between CO measurements, combustion optimization, and energy saving is shown at the industrial scale. Several industrial cases will be shared during this talk.

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