

An 'eye' that measures liquid steel temperatures

August 22 2011



Contact-free measurement of the temperature of molten steel boosts the productivity of arc furnaces. That's why Siemens has developed a system called Simetal RCB Temp, which consists of an optical sensor that can determine the temperature of the molten metal in the steel production process (over 1,500 degrees Celsius) at shorter intervals than was previously the case. As a result, the best time to tap can be determined more exactly, thus saving time and energy and increasing work safety.

To produce [steel](#) in electric arc furnaces, scrap metal is melted down in a process that requires the temperature of the molten metal to be exactly and reliably measured. RCB Temp makes optimum melting sequence times possible, resulting in lower energy consumption and operating

costs. Previously, the temperature had to be measured with measurement cartridges through the open slag door, because optical measurement systems are too sensitive to heat and soiling to be installed inside the furnaces. Manual measurements are strenuous, hazardous, and limit the number of measurements that can be taken until the steel is tapped. Siemens Industry has now successfully integrated the RCB (Refining Combined Burner) system into a robust optical temperature sensor.

The RCB system consists of a burner for melting the scrap metal and a lance for injecting a precisely concentrated stream of oxygen into the liquid steel. In order to measure the temperature, an inert gas is injected into the steel instead of oxygen. The gas stream enables the system to “look” into the molten metal like an eye, allowing the optical sensor at the rear of the lance to detect the liquid steel’s infrared radiation. The resulting data is used to calculate the [temperature](#) of the [molten metal](#) with the help of a special algorithm. The system doesn’t require measurement cartridges and can measure temperatures through a closed slag door and when heating power is on. And because the sensor is positioned at the rear of the lance, it is protected against damage when scrap iron is fed into the furnace.

Arc furnaces can easily be retrofitted with Simetal RCB Temp when they are shut down for maintenance. The system can increase [productivity](#) by up to two percent so that the investment is recouped in less than six months.

Provided by Siemens

Citation: An 'eye' that measures liquid steel temperatures (2011, August 22) retrieved 21 June 2024 from <https://phys.org/news/2011-08-eye-liquid-steel-temperatures.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.