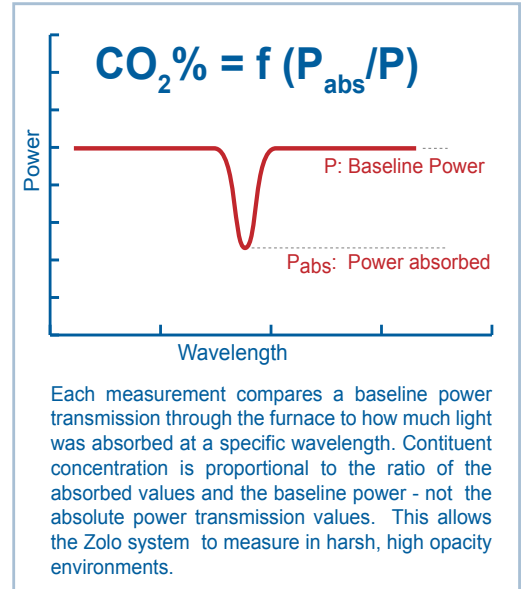


### EAF Process Diagnostic System

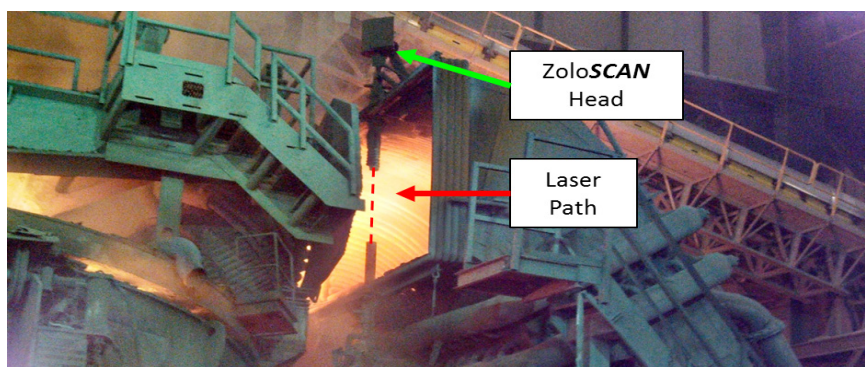
The Zolo Technologies' Zolo**SCAN-EAF** is an innovative laser-based EAF process diagnostic system which simultaneously measures temperature, CO<sub>2</sub>, CO and H<sub>2</sub>O in near real-time, directly in the off gas of an Electric Arc Furnace (EAF). Measurements are taken adjacent to the gap between the fourth hole elbow and stationary D1 duct. Specially designed water-cooled probes are mounted so that the Zolo**SCAN-EAF** laser measures pure EAF process gas without any dilution air contamination. The result is continuous data flow with less than a two (2) second data update. No other system can match the speed or reliability of the Zolo**SCAN-EAF** for continuous off gas and temperature measurement of the EAF process.



### Proven Technology

The Zolo**SCAN-EAF** utilizes a well-proven technique known as Tunable Diode Laser Absorption Spectroscopy (TDLAS). Developed in collaboration with Stanford University, Zolo's TDLAS uses multiple lasers each tuned to the unique absorption wavelengths of a specific constituent. Zolo systems are designed for ultra-harsh environments such as a steel plant. As the global leader in industrial TDLAS systems, Zolo has over 50 systems installed on steel reheat furnaces, EAF, refinery applications and coal-fired boilers around the world with very high reliability.

The Zolo**SCAN-EAF** combines multiple lasers onto a single optical fiber to simultaneously measure multiple constituents. Two SensAlign™ heads are installed adjacent to the gap between the 4th hole elbow and stationary D1 to send (pitch) and receive (catch) the laser signal through a specially designed water-cooled probe. The laser light is transmitted through the EAF off gas via the pitch head and collected by the catch head and routed back to the control rack via optical fiber. In the control rack, the combined laser light is separated so that the light absorbed by each constituent is measured to determine the average concentration of CO<sub>2</sub>, CO and H<sub>2</sub>O and temperature along the laser measurement path.

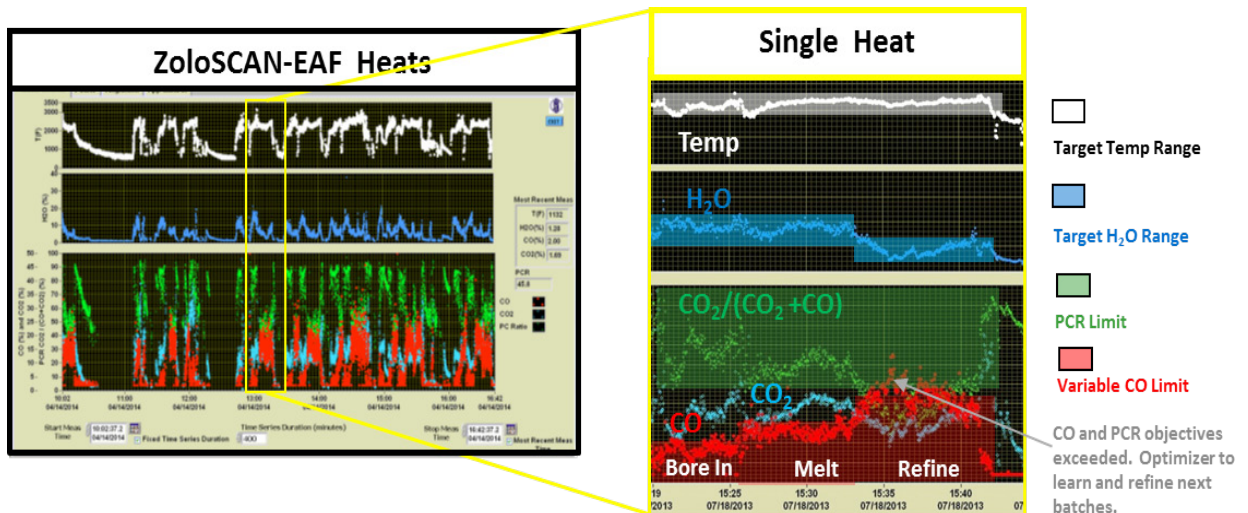


## Robust Design

The ZoloSCAN-EAF control rack is located away from the EAF in a NEMA 12 enclosure and houses all of the sensitive electronics such as the lasers, detectors and computer. The specially designed water-cooled probes stand up to the abrasive and corrosive environment of the EAF waste gas for well over a year. The ZoloSCAN-EAF has successfully overcome opacity issues that plagued earlier laser systems resulting in less than 2% down time or missed data. Overall response time is less than two seconds for reporting: CO<sub>2</sub>, CO, temperature and H<sub>2</sub>O for continuous leak detection.

## Process Control Optimization

Zolo has partnered with AMI GE to offer a complete closed-loop system which provides steel makers with a turnkey process optimization solution. The new *Off-Gas Module* of the renowned AMI GE SmartARC/SmartFurnace System is integrated with the ZoloSCAN-EAF to optimize energy inputs, foamy slag formation and reduce overall energy inputs.



## Process Safety

ZoloSCAN-EAF data can also be used to improve EAF safety by identifying water leaks or the potential for violent reactions. In simulated water leak tests, the ZoloSCAN-EAF rapidly detected these events. If process safety is important, ZoloSCAN-EAF offers rapid measurements to maintain proper melt operation and react quickly before a small problem develops into process downtime, equipment failure or safety issues associated with an uncontrolled batch.

## Benefits of ZoloSCAN-EAF

- ▶ Process Optimization
  - ▶ Reduce O<sub>2</sub> consumption
  - ▶ Reduce electricity consumption
  - ▶ Reduce carbon injection
  - ▶ Slag formation
- ▶ Improve Productivity
  - ▶ Reduce tap-to-tap time
- ▶ Safety
  - ▶ Identify water tube leaks



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