

Internationally Approved  
EN 15267 Certified



Continuous Emissions Monitoring  
and Process Control

# Steel Plants

# Continuous Emissions Monitoring and Process Control Steel Plants

Process control and emission monitoring in a steel plant can be a challenge. A large number of gaseous components needs to be measured with high accuracy. The environment is corrosive with high temperatures and high dust load. To use an extractive gas analyser in this environment will require a lot of maintenance.

The OPSIS cross-stack system is different and provides a gas analyser that will operate with a minimum of maintenance. The OPSIS system is based on a non-contact DOAS/FTIR or TDL method using an optical path that can operate across the duct. The light is transported in an optical fiber to the analyser and one analyser can operate several ducts.

A single OPSIS system can measure all relevant gases, such as NO, SO<sub>2</sub>, CO, CO<sub>2</sub>, NH<sub>3</sub>, HCl, HF, O<sub>2</sub>, H<sub>2</sub>O and temperature.

Examples of applications:

- Electric arc furnace
- Coke plant
- Converter
- Sinter plant
- Steel production
- Steel rolling

## RETURN OF INVESTMENT

The cost of investing in an OPSIS system is small compared to the amount of money that is spent on maintaining old and complex extractive systems. The OPSIS system has low cost of ownership based on few moving parts, long intervals between calibrations, easy operation and low energy consumption.

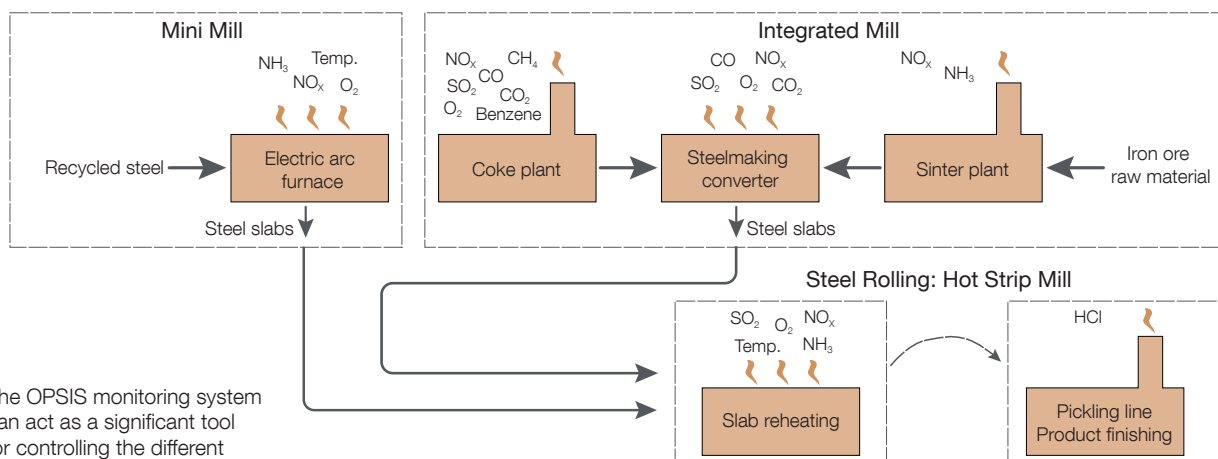
## TEST AND APPROVALS

The OPSIS systems have been tested and approved by a number of internationally recognized institutes and authorities. The systems are approved according to EN15267, and meet the requirements given by U.S. EPA and China EPA.

## OPSIS PRODUCT PORTFOLIO

OPSIS offers a full product portfolio for measurements of gases in a range of applications. It includes complete CEM systems including reporting, process analysers for raw gas measurements, TDL analysers for NH<sub>3</sub>, HCl, O<sub>2</sub>, oxygen analysers, and Hg analysers.

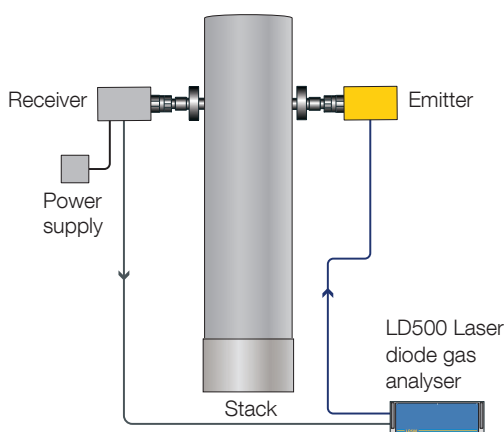
**QAL 1 CERTIFICATION:**  
BEST PERFORMANCE  
LONGEST CALIBRATION INTERVAL



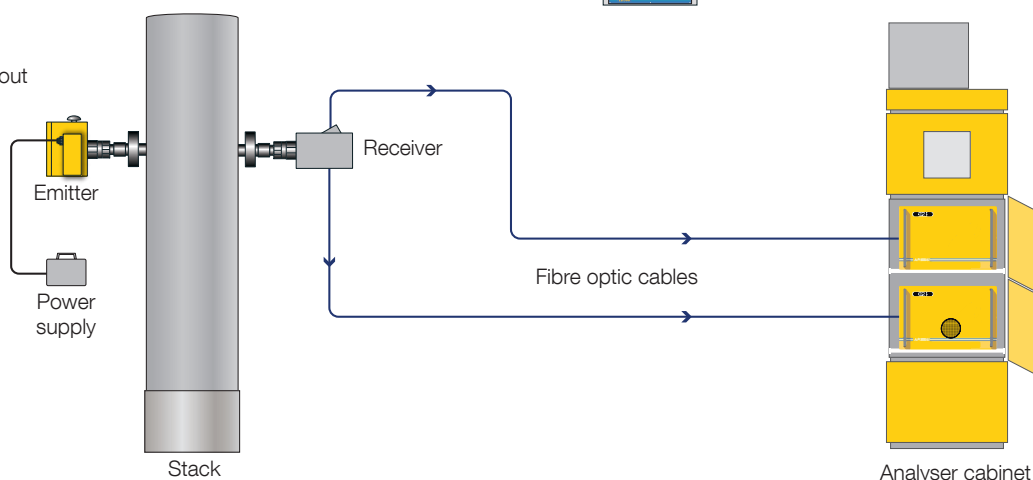
The OPSIS monitoring system can act as a significant tool for controlling the different emissions and process control spots at a steel plant

# SYSTEM OVERVIEW

Configuration of an OPSIS laser diode analyser system



An OPSIS system layout for a steel plant



## PERFORMANCE DATA

(typical data which may vary depending on application)

Compound	Typical measurement range (1 m path) <sup>(1)</sup>	Lowest measurement range according to EN 15267	Min. detectable quantities (monitoring path 1 m, measurement time 30 sec.)
<b>UV/IR DOAS Analyser Models AR600 / AR602Z / AR602Z/Hg / AR602Z/N / AR602Z/NHg / AR620</b>			
NO <sup>(2)</sup>	0–2000 mg/m <sup>3</sup>	0–150 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
NO <sub>2</sub>	0–100% Vol.	0–20 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
SO <sub>2</sub>	0–100% Vol.	0–75 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
NH <sub>3</sub> <sup>(3)</sup>	0–1000 mg/m <sup>3</sup>	0–10 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
H <sub>2</sub> O	0–100% Vol.	0–30% Vol.	0.1% Vol.
Benzene	0–1000 mg/m <sup>3</sup>	0–20 mg/m <sup>3(5)</sup>	1 mg/m <sup>3</sup>
HCl	0–10000 mg/m <sup>3</sup>	0–1000 mg/m <sup>3(5)</sup>	10 mg/m <sup>3(4)</sup>
CO <sub>2</sub>	0–100% Vol.	0–30% Vol. <sup>(5)</sup>	0.5% Vol.
<b>FTIR DOAS Analyser Models AR650 / AR650/N</b>			
HCl	0–100% Vol.	0–15 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
CO	0–100% Vol.	0–75 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>
H <sub>2</sub> O	0–100% Vol.	0–30% Vol.	0.1% Vol.
NH <sub>3</sub>	0–100% Vol.	0–100 mg/m <sup>3(5)</sup>	2 mg/m <sup>3</sup>
CO <sub>2</sub>	0–100% Vol.	0–20% Vol.	0.1% Vol.
CH <sub>4</sub>	0–100% Vol.	0–20 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>
<b>LD500 Laser Diode Gas Analyser</b>			
CO	0–100% Vol.	0–10% Vol. <sup>(5)</sup>	0.1% Vol.
CO <sub>2</sub>	0–100% Vol.	0–30% Vol. <sup>(5)</sup>	0.1% Vol.
H <sub>2</sub> O	0–100% Vol.	0–30% Vol. <sup>(5)</sup>	0.1% Vol.
HCl	0–100% Vol.	0–15 mg/m <sup>3(5)</sup>	0.5 mg/m <sup>3</sup>
HF	0–100% Vol.	0–1.5 mg/m <sup>3(5)</sup>	0.1 mg/m <sup>3</sup>
NH <sub>3</sub>	0–100% Vol.	0–10 mg/m <sup>3(5)</sup>	0.5 mg/m <sup>3</sup>
O <sub>2</sub>	0–21% Vol.	0–20% Vol. <sup>(5)</sup>	0.1% Vol.
Temperature	0–1400°C	0–20 mg/m <sup>3(5)</sup>	5°C
CH <sub>4</sub>	0–100% Vol.	—	0.5 mg/m <sup>3</sup>

### Accuracy

Better than 2% of measured value or equal to the detection limit (whichever is greater).

### Span drift

Better than 2% per year.  
Please, refer to QAL1 documents.

### Zero drift

Better than 2% of measurement range per year.  
Please, refer to QAL1 documents.

### Linearity error

Better than 1% of measurement range.

<sup>(1)</sup> This data refers to a light path of 1 m. For longer paths the maximum range is proportionally smaller. Products are available to create shorter paths in very wide stacks.

<sup>(2)</sup> Maximum SO<sub>2</sub> concentration 5 g/m<sup>3</sup> × m.

<sup>(3)</sup> Maximum SO<sub>2</sub> concentration 500 mg/m<sup>3</sup> × m.

<sup>(4)</sup> Monitoring path 5 m, measurement time 30 sec.

<sup>(5)</sup> Lowest measurement range.

- Recommended monitoring path length: 1 to 5 m.

- After wet scrubbers or when particulate concentration averaged over 1 m is higher than 5 g/m<sup>3</sup>, the monitoring path length may have to be reduced.
- Max. length of fibre optic cable: please refer to product sheet P9 and P16. Besides the compounds above, the OPSIS system can monitor the following gases: nitrous oxide (N<sub>2</sub>O) sulfur trioxide (SO<sub>3</sub>), hydrogen bromide (HBr), bromine (Br<sub>2</sub>), iodine (I<sub>2</sub>), hydrogen cyanide (HCN), hydrogen sulfide (H<sub>2</sub>S), phosgene (COCl<sub>2</sub>), and others.

# Continuous Emissions Monitoring and Process Control by OPSIS

- Multiple monitoring points using a single analyser
- No sampling required, non-contact measurement system
- Best performance according to QAL 1 certification
- Longest calibration interval according to QAL 1 certification
- Fast response time for process control applications
- Applications with high dust level, highly corrosive environments, and high temperature
- Can be installed in explosive areas
- AQM and fence-line monitoring capabilities
- A wide range of software tools for environmental management
- Low energy consumption
- Gas calibration only once per year
- Internationally approved
- Thousands of systems installed worldwide
- Serviced by highly skilled service network

## UK & Ireland Distributor



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2018 03

Please contact your OPSIS supplier to discuss your particular system requirements, including the compounds you wish to monitor. Separate product and other industrial application sheets are available. Specifications subject to change without notice.

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