DURAG GROUP

Press release

Stack emissions multi-gas analysis

OFCEAS® technology seduces the market

Hamburg, 9 October 2024 – In response to environmental challenges, and relying on the best available techniques, regulations are evolving to meet ever-lower emission limit values (ELVs). In this context, a technological innovation stands out: ProCeas LaserCEM® from AP2E, a French manufacturer (member of DURAG GROUP) using patented OFCEAS® (Optical Feedback Cavity Enhanced Absorption Spectroscopy) technology. This technological breakthrough offers a more accurate, efficient and sustainable solution for continuous monitoring of gaseous pollutant emissions into the atmosphere.

A solution to regulatory and environmental challenges

Air quality and the monitoring of industrial emissions play a major role in public health.
Industrial stacks, for example, are subject to new regulations requiring continuous monitoring of pollutants at ever-lower concentrations.

Traditional technologies for this type of measurement (NDIR, FTIR, etc.) are reaching their detection limits for many pollutants. This is exactly where LaserCEM® finds its relevance.
LaserCEM® uses patented OFCEAS® technology, based on extractive high resolution absorption spectroscopy. This laser-based technology enables measurement of gases in concentration ranges from percent to ppb, with unrivalled measurement quality in terms of accuracy and resolution for a multi-gas analysis system.

LaserCEM® operates with LPS® (low-pressure gas sampling) and a heat-traced sampling line, only maintained at maximum 80 °C, to avoid condensation and guarantee accurate, consistent measurements. In addition, this technology reduces total sample mass flow and thus the amount of impurities. As a result, maintenance is minimized and sample transfer at 180°C is avoided, considerably reducing the energy consumption of the analysis system. The very short response time and low sample volume required by the use of LPS® technology enable longer sample line lengths than conventional heated lines, and therefore greater ease of installation of the analysis system at lower cost.
The combination of OFCEAS® and LPS® technologies enables fast, highly precise and interference-free spectral analysis, whatever the gas matrix to be analyzed. Thanks to its LPS®, LaserCEM® can be adapted to a wide range of applications without the need to heat or dry the sample prior to analysis, which greatly reduces installation, operating and maintenance costs.

LaserCEM® key features

Unique selectivity and precision

LaserCEM®'s OFCEAS technology generates a high-resolution absorption spectrum in picometer range, always in combination with the zero signal. This unique capability minimizes or eliminates interferences, ensuring accurate and reliable measurements of various gases. Thanks to its exceptional selectivity, the system can clearly distinguish gases in complex matrices, offering unrivalled accuracy in pollutant detection. With LPS® technology, absorption spectra are so well defined that cross-sensitivity phenomena are virtually non-existent, enabling measurement of pollutants even in matrices containing over 60% water.

What's more, since the system enables direct measurement without sample modification, maximum representativeness is ensured, guaranteeing measurement of peripheral parameters (water, oxygen) with the same analyzer.

Direct measurement, exceptional sensitivity

Thanks to an optical path of up to 10 km, signal intensity is multiplied by 1,000 compared with conventional technologies. This enhanced sensitivity enables the detection of extremely low concentrations of pollutants with exceptional accuracy, down to parts per billion (ppb).

The system provides direct measurement without sample modification, with unrivalled response times ensuring maximum integrity of the data collected. It is delivered fully pre-calibrated, eliminating the need for daily zero and span calibrations.

LaserCEM® requires no nitrogen, zero air, purge or other carrier gases, simplifying operation and reducing operating costs.

Double QAL1 certification for measurements that are always accurate

The LaserCEM® is a turnkey multi-gas analysis system for continuous, simultaneous measurement of multiple gases such as HF, HCl, NH_3, CH_4, SO_2, CO, CO_2, NO, NO_2, O_2, N_2O, H_2S, CHOH, H_2O, etc. It benefits from double QAL1 certification (by TÜV and MCERTs) according to EN 15267 and EN 14181 and incorporates the QAL3 functionalities defined by EN 14181. Only two reference gas cylinders need to be connected to the QAL3 module. It manages the injection of standard gases at the head of the sampling system, enabling the entire measurement system to be checked. Very low reference gas consumption ensures extended gas cylinders change interval up to one year, consequently reducing costs for gases and labor.

What's more, LaserCEM® offers the lowest certified measurement ranges for hydrogen fluoride (HF) with ranges of 0-1.5 and 0-10 mg/Nm³, for nitrogen monoxide (NO) with a range of 0-78 mg/Nm³, and for carbon monoxide (CO) with a range of 0-30 mg/Nm³.

LaserCEM® significantly reduces operating costs and the efforts related to QAL2 and QAL3 procedures for operators. This is made possible by OFCEAS technology, which includes an optical self-calibration system for each spectrum and an optionally integrated automatic QAL3 module. Advantages: reduced use of standard gases, less gas regulators, faster set-up, simplified logistics and reduced costs.

LaserCEM® modularity and low energy consumption: assets for a sustainable future

LaserCEM® is designed and certified as a modular system, making possible different configurations and the addition of new gases or measuring ranges. This flexibility supports users in bringing their installations up to standard.

This means companies can easily adapt to new regulatory requirements without needing to invest in a completely new system, reducing costs and wasted resources. What's more, ProCeas® technology is used in marine applications, guaranteeing the availability of spare parts or upgrades for over 25 years.

LaserCEM® also distinguishes itself by consuming much less energy than other current analyzers. In fact, the system achieves energy savings of 50 to 80%, depending on the length of the sampling line. This energy efficiency helps to reduce the carbon footprint of emissions monitoring operations, bringing industrial practices in line with sustainable development objectives.

Growing adoption by industry

Given these undeniable advantages, many industries are gradually adopting this technology. The sectors most concerned are energy production, chemicals, metallurgy and waste-to-energy plants (WtoE), where pollutant emissions are particularly tightly controlled. Investment in LaserCEM® is seen not only as a response to regulatory constraints, but also as a commitment to environmental responsibility and sustainability.

In conclusion, LaserCEM® using OFCEAS technology is much more than just a technological innovation. Its modularity and energy efficiency make it a future-proof, evolutive solution, capable of meeting current and future environmental challenges. With its growing adoption (several hundred installations are already in service), this technology promises to become an essential tool for monitoring emissions into the atmosphere, paving the way for a cleaner, more sustainable future.

A complete, turnkey solution for regulatory compliance of industrial emissions

The DURAG GROUP is able to offer its customers a complete solution for monitoring stack emissions. In addition to LaserCEM® and mercury (Hg-CEMS) analyzers, Durag offers continuous dust measurement analyzers, flue gas flow meters as well as data analysis and environmental reporting system needed to effectively track, and report regulated pollutants. This comprehensive, integrated solution ensures full compliance with regulatory requirements and offers optimized emissions management for industries.

Local support, global reach

DURAG GROUP customers benefit from local commissioning, training and service thanks to an extensive network of local partners and subsidiaries, guaranteeing rapid assistance and expertise wherever they may be. DURAG's global reach, combined with local support, ensures efficient service and maintenance, enhancing plant operational performance. In addition, the DURAG GROUP is dedicated to offering comprehensive and innovative solutions to industries, ranging from optimization and safety of combustion plants to environmental compliance and atmospheric impact.

About DURAG GROUP

Based in Hamburg, DURAG GROUP is a globally operating group of companies and one of the market leaders for intelligent solutions in the fields of environmental and ambient air monitoring, data management, as well as ignition systems and safety equipment for industrial combustion processes. The companies associated with the Group offer modern technology, certified equipment and reliable services tailored to the individual needs of customers worldwide. The product portfolio is also ready for the hydrogen (H2) market. This means that DURAG GROUP acts as a single source provider for all industrial processes.

DURAG GROUP is your one-stop partner for the entire plant.

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Press contact
DURAG GROUP Media Relations
Email: press@durag.com
Phone: +49 40 554218 1152
Website: www.durag.com