SENSING EXCELLENCE

Multisensor

CASE STUDY

Monitoring VOC Contamination in the Exhaust Gas from an Industrial WTP

Application Dossier: No. XIV

Application

Monitoring VOC Contamination in the Exhaust Gas from an Industrial WTP

Product

MS1200-01-SYS – Touch version, 4-20 mA without sampling tank. The VOC gas is taken directly from the line which is one metre away.

MS1200
Oil in Water Monitor

Application

Monitoring exhaust gas from an industrial water treatment plant. The exhaust gas is specially treated, and the effectiveness of the treatment process is controlled by the VOC measurement.

Customer

Refinery for coal tar products, Germany.

Problem

The exhaust gas is treated with activated carbon filters. The contaminated carbon filters are reconditioned by desorbing contaminants using a stream of hot air. This air is now contaminated with VOCs which in turn is exposed to UV light. The UV light oxidises the organic compounds removing them from the gas stream. If the VOC concentration in the gas falls below a certain value, the UV process can be stopped to save energy.

Product

MS1200 – Standard version with 4-20 mA output, sampling system, alarm, and fault relays.

Installation Facts

The instrument is installed in a cabinet to provide additional protection from the potentially harsh environment. A sample of the exhaust gas is fed into the MS1200 directly from the sample point.

The VOC content of the gas is analysed every 15 minutes and, if a set limit is not exceeded, the instrument will stop the UV oxidation process, saving energy.

A picture of the unit installed in the cabinet for further weather protection.

Did you know?

Volatile Organic Compounds (VOCs) can be effectively removed from gas streams using activated carbon, a material with a highly porous structure that offers a large surface area for adsorption.

As VOC-laden gas passes through an activated carbon bed, the organic molecules are trapped on the surface of the carbon through physical adsorption, driven by Van der Waals forces. The high surface area, along with the presence of micropores and mesopores in activated carbon, makes it particularly efficient for capturing VOCs of varying molecular sizes and weights.

This method is widely used due to its simplicity, effectiveness, and ability to handle a broad range of VOC concentrations and gas flow rates.

The performance of activated carbon in VOC removal depends on factors such as temperature, humidity, and the properties of the specific VOCs being treated. While activated carbon works well under dry conditions, high humidity can compete with VOCs for adsorption sites, reducing efficiency.

To maintain performance, systems often use pre-drying processes for humid gases. Furthermore, once the activated carbon becomes saturated with VOCs, it must either be regenerated, typically through thermal desorption, or replaced to ensure continued efficiency.

This makes activated carbon a versatile and cost-effective option for VOC removal, commonly employed in industrial, environmental, and air quality applications.

Why Multisensor?

The customer needed a system to monitor VOC Gases in a reliable way in a difficult environment and with the measurement not affected by the humidity.

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For more information

Visit: www.multisensor.co.uk
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Multisensor Systems is a developer and supplier of Water and Gas Analysers specialising in oil in water and hydrocarbon analysers, oil in water detectors, VOC monitors and THM analysers based in the United Kingdom.

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CHANGELOG

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