Success Story

INGOLD
Leading Process Analytics

Reliable and Cost Efficient Monitoring of Process Off-Gases

The oxygen gas measurement system from METTLER TOLEDO is an effective tool in explosion prevention procedures as employed by WACKER at its production site in Burghausen, Germany. This inline measurement substantially reduces maintenance costs and offers real-time monitoring of process off-gases.

Wacker Chemie AG, Burghausen, Germany

Burghausen lies in the district of Upper Bavaria, 110 km east of Munich, close to the border with Austria. The town is characterized by the longest reach of castle compounds in Europe, its medieval quarter, and above all by the WACKER chemical plant site. The works established there in 1914 are today the most important production facilities of the WACKER Group as a whole, and the largest chemical complex in Bavaria. At this over two square kilometer site, some one thousand different products are produced by roughly 10,000 employees divided among 150 different production plants. The spectrum of products ranges from polysilicon and hyperpure silicon wafers over silicones, silanes and silicic acids through to dispersions, redispersible powders, solid resins, paint resins, fine chemicals and biotechnological products.

Direct oxygen measurement in the waste-gas manifold.

METTLER TOLEDO

Business Division SILICONES

WACKER SILICONES ranks among the largest silane and silicon producers in the world. Highly differentiated properties make silicone ideal for a large number of applications. In the sector "Functional Silicones and Oils", under the management of Corinna Müller, about 75 employees are engaged chiefly in the manufacture of preliminary products for e.g. the automobile industry, building materials protection sector, and cosmetics industry.

Comprehensive safety design

Safety is a top priority at all WACKER sites. Thanks to a comprehensive safety program, the accident rate lies well below the average for this industry. Part of the safety program is an effective inertisation strategy for (process) off-gases, i.e. ensuring an oxygen-free waste-gas discharge system. To ensure that the waste-gas stream is totally oxygen-free in terms of active explosion prevention, the "Functional Silicones and Oils" plant employs oxygen measurement technology from METTLER TOLEDO. The safety program stipulates that oxygen concentration in the waste-gas stream must be below 5 vol. % O_2. If this limit is ever exceeded, procedures are immediately triggered to ensure that safety is preserved at all times.

Normally, the concentration of O_2 measured in the waste-gas is below 0.3 vol. % O_2. The waste-gas stream is made up mainly of nitrogen, silanes and hydrocarbons. Traces of other gases may also be present, depending upon the process in operation. The waste-gas has a temperature of approximately 20 °C (68 °F) and 50 – 100 mbar overpressure.

Direct installation in the waste-gas manifold

WACKER chose to use METTLER TOLEDO oxygen measurement technology because sensor design allowed direct insertion into the waste-gas manifold without the need for a costly sample gas conditioning system with high-maintenance requirement. Easy handling, robust design and low-maintenance components are the key factors best describing the oxygen sensor InPro 6800 Gas. Calibration of the sensor is carried out directly in air, and takes only five minutes.

Oxygen measurement system

The complete oxygen measurement system consists of an oxygen sensor InPro 6800 Gas, retractable housing InTrac 777e, and modular high-performance transmitter M 700 XC. All components are certified to ATEX standards EX II 1/2GD EEx ia IIC T6/T5/T4/T3, and labeled accordingly. They are therefore also suitable for use in an inflammable dust environment.

InTrac retractable housings allow sensor maintenance in-situ without having to interrupt the ongoing process. For instance, the sensor can be calibrated or checked in air or other gas directly in the flushing chamber of the housing without removal. The modular high-performance transmitter M 700 provides very precise measurement readings. The unique "Plug & Play" design and modularity of the system offer flexible solutions that can be attuned exactly to the individual measuring task.

Replacement for paramagnetic systems reduced costs

Oxygen measurement technology from METTLER TOLEDO has now replaced the paramagnetic systems formerly used for monitoring the waste-gas stream. Maintenance effort had been considerable, since very often traces of oils and other substances caused damage to the sensitive measurement devices, calling for frequent cleaning and repair work. The METTLER TOLEDO measurement technology met WACKER's extensive needs due to easy handling and the possibility of installing the sensor directly into the waste-gas stream without having to condition the gas prior to measurement. *"Therefore the costs arising from the complex sample gas conditioning now no longer apply, and overall maintenance costs have been reduced quite substantially"*, stated plant engineer Markus Krämer.

In 2006, a further three points will be converted to take METTLER TOLEDO oxygen measurement equipment.

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