Application Update
Multi-compartment Baghouse Performance Monitoring for Reduced Operating Costs

Industry Sector: Waste to Energy  Dust Loadings: Less than 10 mg/m³
Material: Animal Waste  Installation: 8 Individual Baghouse (Combustion by product) compartment outlets

Application

Waste to Energy Plants operate under strict particulate emission control limits, which typically requires the installation of multi-compartment baghouses. Providing a high degree of filtration efficiency, these filters require regular maintenance for optimum performance. Due to complexities of large multi-compartment filters, finding potential leaks can be a complicated and time-consuming task. The current (European) Emission Limit Value (ELV) is relatively low (10 mg/m³), therefore, the consequences of filter leaks can rapidly result in breaches of the emission limit. If solely reliant on the main stack emission monitor for indication of emission limit excursions, the filter failure event will already be underway. To ensure compliance is retained, the ability to locate which compartment contains the leak is a highly valuable process operation tool.

Solution

The PCME LEAK LOCATE 320 system is designed to monitor the dust release from each filter compartment and is able to detect leaks as they develop, even down at very low emission concentrations. A sensor is installed in the clean gas output of each filter chamber, so that it can monitor the dust releases in isolation from all others, which enables comparison to be made between each compartment. Using ENVEA’s unique and patented ElectroDynamic® technology, the sensors successfully detect very low level dust releases (eg 1 - 2 mg/m³) and bring the benefit of not requiring air purging as the measurement is unaffected by product build-up on the sensor rod. To provide additional confidence in the measurement, the optional sensor Probe Check assures the integrity of the sensor’s measurement.

The Modbus infrastructure allows for the simple installation of multiple sensors on a single network. Local graphical display of comparative compartment performance is provided via the ProController, together with short term data recording of filter trends which can be used to identify individual filter row degradation (dependant upon filter cleaning mechanisms). Remote observation of dust emissions and filter performance is provided in real time via in-built Ethernet connectivity and use of the PCME DUST TOOLS software.

This solution provides plant maintenance teams with early warning alarms of compartments beginning to release higher levels of dust and enabling the identification of filter degradation down to row level. Knowing where the leaks are developing enables process stoppages to be scheduled and saves time and resources by highlighting where the leaks are developing and which bags need to be changed. By detecting leaks early, this ensures that the ELV is not breached which will become even more valuable when the latest BATC Guidance documents are implemented in Europe where 2 - 5 mg/m³ ELV is anticipated.

Benefits

Reduction in maintenance times and costs: from up to 8 working days to 1 on this site
Enables proactive maintenance regimes
Allows local and remote real time observation of filter performance
Identification of compartment degradation before breaches in environmental limits
Aids the assessment of differing bag filter constructions
Reduction in lost power generation time
Reduction in alternative waste disposal costs, eg landfill
Reduction in exposure time to compartment dust by Maintenance Teams

PCME LEAK LOCATE 320 sensors installed in baghouse compartments