

Carbon Black

Long-term reliability was needed in processes where most other devices have failed.

“For 1.5 years, Auburn’s Probes have not required cleaning or maintenance.”

Challenge

Raw carbon black production processes are extremely harsh and demanding. Temperatures can reach 1400°F, moisture is used to control quality, and SO₂ presents corrosion issues. For any type of instrument, carbon black processes are among the most challenging.

For particulate monitoring, the concentrated black powder complicates opacity and light scatter device operation. Carbon black is highly conductive; this challenges triboelectric and other charge-measuring instruments that use a sensing probe, which must remain electrically isolated, to function properly.

The US-EPA is tightening regulations and increasing enforcement within the industry.

This led two carbon black producers experiencing ongoing problems with unreliable particulate monitors, the potential for unforeseen shutdowns, costly refurbishment of sensing elements, and poor existing supply support, to take proactive steps to ensure compliance and improve operations. Auburn was recommended for better support and more reliable products.



Solution

Auburn was confident the charge induction technology probe was a reliable solution for carbon black applications, but both producers needed to prove it first hand in their processes.

Plant A tested Auburn against a competing charge-induction device and an optical PM CEMS. After one month of initial run time, the plant performed a comparison to increased emissions by creating leaks in baghouse filters.

Plant B required proof of long-term reliability. Having previously tested and ruled out an optical monitor, this plant purchased Auburn particulate monitoring sensors and compared it against their existing charge-sensing systems for over a year. The existing devices require weekly to quarterly cleaning and frequent costly refurbishment. Side-by-side installations were set up on four challenging processes: the dryer drum, the reactor, the main unit filter, and the process filter.



A PS 10 sensor is installed providing reliable performance in the outlet of a dryer drum; Auburn engineer observing control unit display.

**A unanimous decision to recommend
Particulate Monitors by Auburn.**

Results

Plant A

The test team of engineers for Plant A reported they made a unanimous decision to recommend Auburn. This was based not only on the superior performance against the competition (Figure 1), but on the lower main-tenance and quality proactive support by Auburn.

They added that while the optical system was “very sophisticated, it was cumbersome, required costly/complex installation, more maintenance, and was simply not practical for our facilities.”

Plant B

Project engineers found similar response data during the trials, but substantial reliability differences. For one process, the plant did not perform cleaning on the Auburn system for over 1.5 years while the other system initially required weekly cleaning and was improved to monthly. For the other three processes, Auburn instruents were also not cleaned for over 1.5 years, while the other systems required cleaning every 3-4 months. There were also no signs of refurbishment requirements with the Auburn probe sensor.

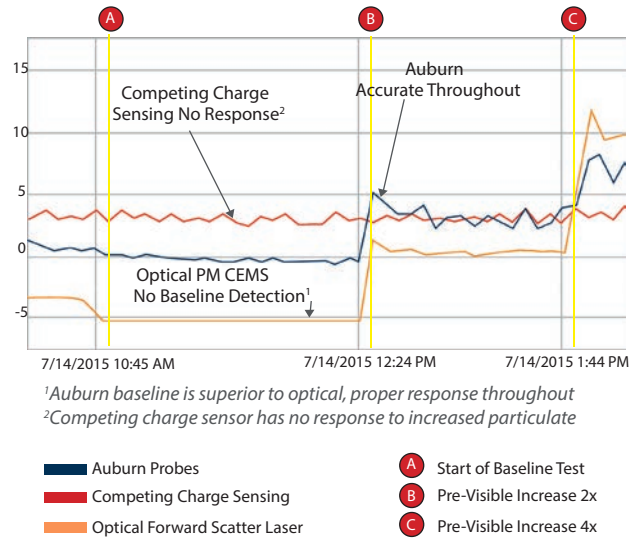
While response was indeed similar, Auburn demonstrated higher resolution and lower-level measurement capabilities (Figure 2).

The PM 100 PRO system provides full automatic device health checks and automatic EPA self tests. This provides the plant with even further confidence in particulate monitoring by Auburn.



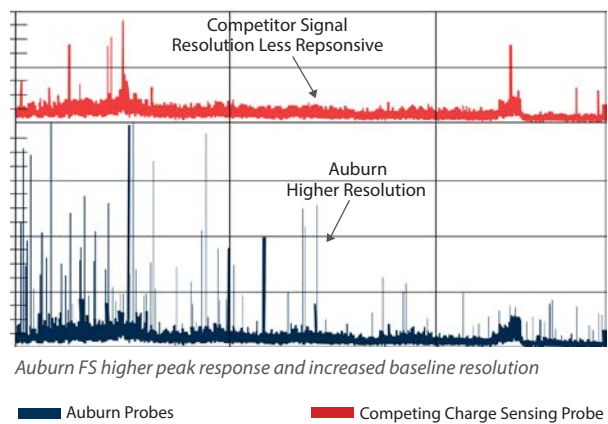
Auburn engineer commissioning PM 100 PRO.

Figure 1 – Plant A: Low-Level Response Testing



¹Auburn baseline is superior to optical, proper response throughout
²Competing charge sensor has no response to increased particulate

Figure 2 – Plant B: Dryer Drum Comparison



Auburn FS higher peak response and increased baseline resolution

Auburn particulate monitoring technology offers carbon black producers the best available solution to prevent tenacious emissions while minimizing instrument maintenance, repair/refurbish costs, and unplanned down time.

Auburn B-PAC™ (baghouse control and diagnostic systems) and FilterWARE (central HMI/SCADA software) provide significant operational ROI opportunities and further process and compliance optimization.

Proactive, high-quality product support allows producers to focus on core operations and improve profitability.



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