Application Note

Asphalt

Hot Mix Asphalt (HMA)

Industry Proves DynaCHARGE™ to Be Reliable Technology for Air Quality Rule 1155

No False Alarms Like Tribo and Opacity

Asphalt plants require uninterrupted batch processing while adhering to EPA regulations.

Challenge

In April, 2010, California South Coast Air Quality Management District (SCAQMD) passed Rule 1155, requiring all industries that operate baghouses and dust collectors with 7500 ft^2 or more of filter area to install particulate monitors for filter leak detection and to have no visible emissions.

The asphalt industry was concerned with the new rule. In prior years, many plants were proactive and installed other charge sensing devices, triboelectric broken bag detectors, and opacity monitors. Due to batch processing with high moisture and sticky particulates, these systems were repeatedly unreliable. False alarms significantly hampered production, while frequent maintenance and confusing alarm setups were typical.

SCAQMD agreed to an extension of the rule for the asphalt industry to provide time to determine if reliable technology was available for hot mix asphalt processes.

Blue Diamond Materials volunteered their Inglewood, CA, facility for a test. They were advised that Auburn FilterSense's DynaCHARGE™ particulate monitoring technology is a proven, reliable solution in many moist and demanding processes (such as chemical spray dryers and carbon black raw production). An Auburn FilterSense DynaCHARGE particulate monitoring system was installed on their hot mix baghouse.

Even with startup moisture and dust build-up on the sensor, DynaCHARGE™ performed reliably.

Solution

After several months of comprehensive testing, and after a 12-month follow up, DynaCHARGE proved to be a reliable solution to meet Rule 1155. DynaCHARGE charge induction sensing, combined with Auburn FilterSense's unique fully insulated probe, provided complete reliability in hot mix asphalt (HMA) processes.

DynaCHARGE never produced a false alarm (even during high-moisture start up) and didn't require cleaning for over 12 months. Previous charge, triboelectric, and opacity monitors required routine cleaning, ranging from daily to monthly.

DynaCHARGE proved reliable and demonstrated high accuracy **Pre-Visible™ leak detection** with real-time mass monitoring capabilities.

DynaCHARGE™ particulate sensor consistently performed reliably when subjected to moisture and asphalt dust build-up.

Application Note

"DynaCHARGE™ accurately detected a single 0.75″ slit in one of 500 filter bags."

Test Results

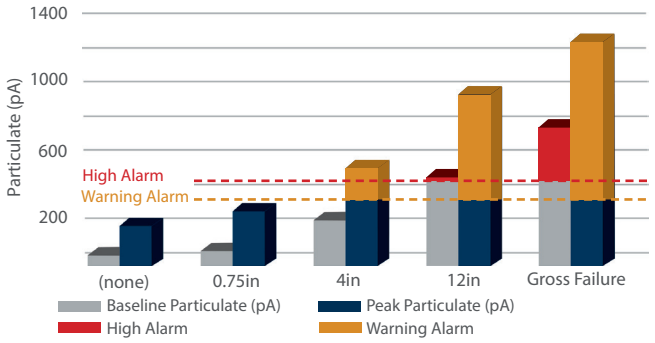
Dependable Pre-Visible™ Leak Alarming
After confirming the filters were in good non-leaking condition, baseline and cleaning cycle peak readings from the DynaCHARGE™ were observed. Baseline and Pre-Visible alarm levels were set. The plant then began a series of controlled leak tests. First, a single 0.75″ slit was cut in one of the 500 filters.

A 0.75″ control slit was cut into 1 of 500 filters.

The slit was increased to 4″, then 12″, and then torn open on the bottom edge to simulate a complete filter failure.

DynaCHARGE data was accurate, responding proportionally to each increase. The earlier selected alarm levels correctly reflected the filter and emission conditions, demonstrating that setting effective alarm levels was simple.

Figure 1 -- DynaCHARGE™ Leak Test Results



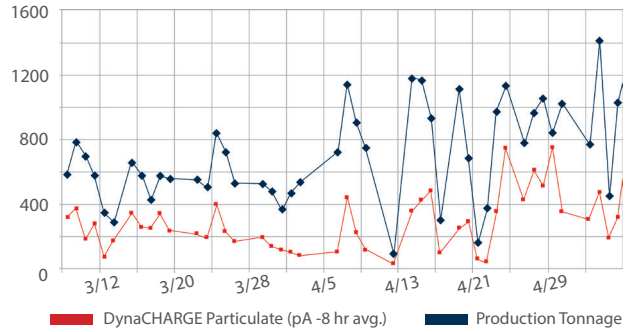
Slit Size	Pre-Visible Alarm Peak (pA)	High Alarm Baseline (pA)	Visible Emissions
(none)	No	No	No
0.75in	No	No	No
4in	Yes	No	No
12in	Yes	Yes	Barely
Gross Failure	Yes	Yes	Lightly

Setting the alarm was very easy and accurately reflected Pre-Visible™ and compliance conditions.

Accurate Response to Mass Emissions
Accurate filter leak detection is based on proportional response to mass emissions. Simple gross-failure "broken bag detectors" and opacity monitors, even when recently cleaned, do not respond accurately to mass, especially to small increases.

DynaCHARGE output data accurately demonstrated the expected correlation between processed material tonnage and emissions.

Figure 2 -- Relative Mass Emissions vs Production Rates



Benefits

A smoothly running baghouse is critical for asphalt production to keep road paving on schedule. Planning filter maintenance ahead of time, and meeting compliance with low maintenance, is necessary. DynaCHARGE is inherently very reliable and offers automatic self-tests to provide plants with further confidence and EPA assurance.

B-PAC™ (Baghouse Performance Analyzer & Controller)
To conduct the test with a high level of data analysis, and to improve plant operating efficiency, Blue Diamond also installed an Auburn FilterSense B-PAC for intelligent filter control and diagnostics.

The B-PAC's **IntelliPULSE™ DP Control** maintains nearly constant DP through varying flow, maximizing production while minimizing pulse cleaning, thus decreasing emissions, extending filter life, and reducing energy consumption.

B-PAC diagnostics locate filter leaks by row, enabling the plant to replace only the damaged filters, saving time and expensive filter replacement costs. B-PACs instantly locate failed solenoids and pulse valves preventing air loss and moist asphalt dust from blinding filters, which initiates cascading problems. B-PACs enable staff to focus on production and proactive baghouse maintenance before major problems ensue.

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