Auburn
A Nederman Company

Primary Aluminum

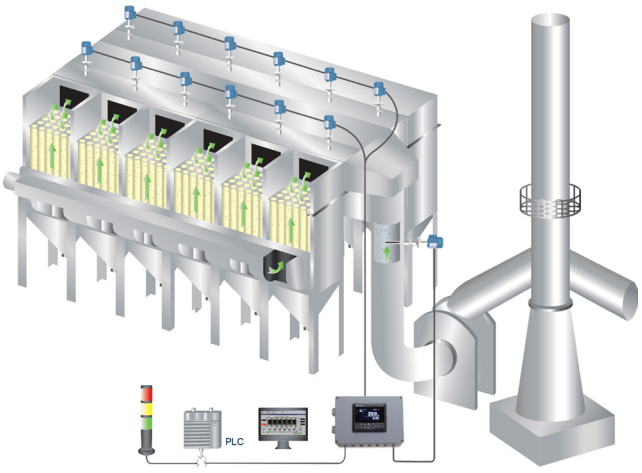
Aluminum Producer Maintains Emissions Below 1 mg/m³ from a 2.8M CFM Process

Auburn Particulate Monitoring System Outperforms Forward Scatter PM CEMS

Challenge

"[Aluminum producer] employs best practices to always be a good corporate citizen and neighbor."

At Iceland's largest aluminum smelter, located in a pristine glacial fjord, air flow through the stack is 2.8M CFM after being treated by two Gas Treatment Centers (GTC), each consisting of a 12-compartment baghouse with a total of 23,020 individual filters. The challenge for this plant was to keep particulate emissions as low as possible while minimizing downtime and expenses to maintain the baghouses.

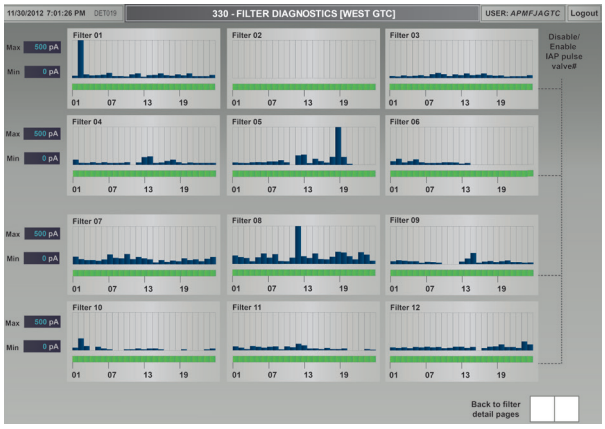


Aluminum producer maintains emissions below 1 mg/m³ (1/5 the design performance of 5 mg/m³) on 2 filtration systems (East & West); each has 12 compartments containing 11,510 individual filters.

Solution

This aluminum producer's approach to this challenge was to employ Best Available Technology (BAT) for all aspects of the process. This began with selecting Fives Solios, a leader in aluminum plant emissions control, for the engineering and supply of two high efficiency GTC's.Management then applied BAT for monitoring and optimizing baghouse performance by choosing Auburn's particulate monitoring technology employing charge induction sensing. This advanced technology in each compartment is enabling the plant to maintain the GTC filters in optimum condition yielding emission below 1 mg/m³ (1/5 of the design guarantee of 5 mg/m³). Integrated filter-cleaning control enables locating developing leaks by row, which is key to replacing filters quickly, as needed, before emissions increase. This saves countless man hours manually searching for leaks, minimizing downtime and employee exposure to hazardous PM and confined spaces.

The process engineer stated that manual leak searches are "down to a single row of 20 filters instead of 960 for each compartment."



Control Room view of Auburn leak detection by row.

PM 100 Monitoring

Maintaining emissions at such a level below the design value is only achievable because of the unique performance of Auburn and the proactive maintenance commitment of this plant.

Their commitment to best practices didn't end there. A Auburn PM CEMS (Particulate Matter Continuous Emission Monitoring System) was installed alongside an optical forward scatter PM CEMS in the common outlet of each baghouse to monitor total particulate for regulatory compliance. Forward scatter technology is known for low-level detection and is widely used for compliance. After onsite commissioning by Auburn, the process engineer stated,

"The PM 100 is working excellent; it shows us small changes better than forward scatter and we don't have to worry about signal strength (decreasing with dust buildup). It is and will be ourmain filter analyzer."

Comparison tests proved Auburn provided superior leak detection below 1 mg/m³ (Chart 1), similar mass linearity (Chart 2), and superior baseline measurement (Chart 3). Aubrun is simpler to install without the need for calibration or lens alignment and operates with at least a 6 times longer maintenance interval. Operators commented, "The forward scatter needs calibration at least once a year and lens cleaning once or twice per month." Auburn has a 6–12 month simple inspection where there has been no need to perform sensor maintenance. "The on-site support from [Auburn] has been excellent."

"The comparison is easy; Auburn products just work without any interference."

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To learn more about this study

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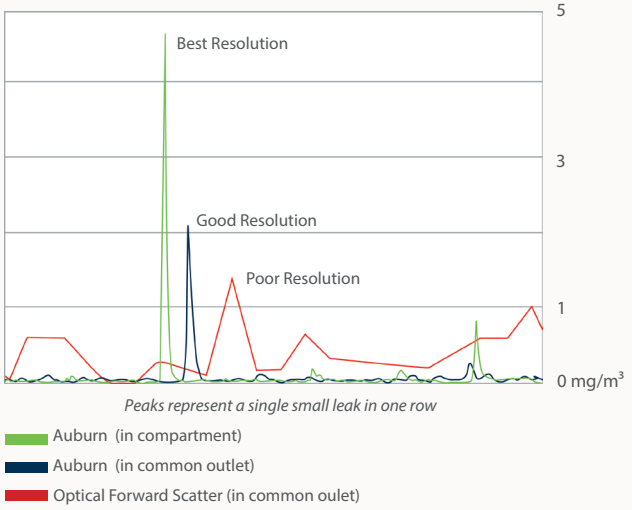
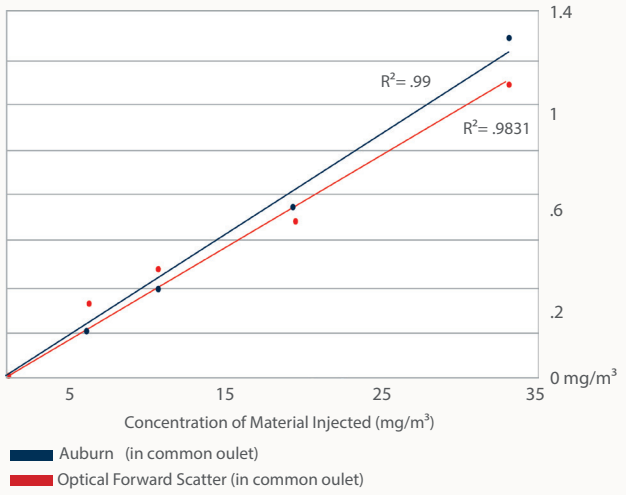
Auburn vs. Optical Forward Scatter

1. Leak Detection



2. Mass Linearity



3. Baseline Measurement