

Case Study

Dust Monitoring System Provides Quality Real-Time Data at the World's Largest Aluminium Smelter

Accurate on-line data in real-time for maintaining world-class product quality



Project

Emirates Aluminium (EMAL)

Location

United Arab Emirates

Date

2012

Services

1 x Dust Profiler outdoor particulate monitor

Measurements

PM₁, PM_{2.5}, PM₅, PM₁₀, and TSP

Sector

Aluminium



The customer

Emirates Aluminium (EMAL) is a state-of-the-art aluminium smelter complex supplying the world with high quality metal. The advanced smelter in Al Taweelah will produce 1.3 metric million tonnes by the end of 2014, making it one of the largest single site smelters in the world.

The site currently includes a 2,000 MW power plant, which will increase to approximately 3,000 MW by 2014, a carbon plant and a flexible cast house with the capacity to produce a wide variety of world-class products. A purpose-built wharf at Khalifa Port shortens the supply chain of raw materials direct from sea to smelter.

The problem

EMAL understands that the customer's needs come first, and so has invested in the best available plant and equipment to allow it to meet today's high standards and the needs of tomorrow. High quality raw materials and modern production management system ensure that EMAL products are equal to the best anywhere. To achieve such quality of sheet ingot, different sizes of particulate matter must be monitored continuously in Cast House (an outdoor space under shaded cover). To maintain the quality of its products, EMAL requested a solution to monitor PM_{10} , $PM_{2.5}$, PM_5 , PM_1 and TSP at the same time, continuously, and in real time.



Among different solutions and methods, the proposed equipment could not include any radioactive source, which is commonly used in the Beta Attenuation Method (BAM), because of the health and safety implications of working with such equipment. In this case there were other limitations of the BAM including cost, restriction to one particle size measurement, and inability to provide data in real time. In addition, a local company was required to design and engineer a system that would provide the results in the control room (a few metres from the equipment) with on-line reporting software as well as analogue signals. Local support including maintenance and calibration was another important concern to the client in selecting the right equipment and supplier.

“EMAL understands that the customer's needs come first, and we have invested in the best available plant and equipment”

Emirates Aluminium (EMAL)

The solution

Aeroqual's local representative Enviro & Industrial Solutions (EIS) proposed a Dust Profiler for the application. The Dust Profiler comprises of a particle counter which uses scattered light to measure and count particles. It was configured to measure continuous and simultaneous measurement of PM_{10} , $PM_{2.5}$, PM_1 , and TSP. In addition, to meet all the client's requirements, Aeroqual set the device to monitor all the requested particulate fractions including a specific setting for PM_5 monitoring.

EIS were also able to offer an annual maintenance contract for the Dust Profiler, meaning that periodic maintenance and calibration would be carried out by an expert provider. This additional support gave EMAL the confidence they needed to proceed.



Evaluation

Thanks to the flexible platform and robust design of the Dust Profiler and on-time and proper maintenance plan prepared by EIS and Aeroqual, EMAL is very satisfied. The agreed service plan includes a site visit and service at every three months and six-monthly site calibration using a Low Volume Sampler (LVS) to perform calibration against the European reference method EN12341. The total solution has proven to be very cost-effective and provides EMAL with accurate on-line data in real time to help maintain the quality of its products at the highest level.