

Environmental and Nuisance Dust Monitoring

Awareness of dust from industrial activities such as construction and demolition has increased substantially over the past twenty years. This was initially instigated through the implementation of Part IV of the Environmental Protection Act 1995 and the Government's UK Air Quality Strategy (1997). These documents set out limit values controlling the mass concentration of airborne PM₁₀, these being:

- 24-hour mean of 50 µg/m³ not to be exceeded more than 35 times a year
- and
- Annual mean of 40 µg/m³ to be met by 31 December 2004.

A provisional objective (annual mean) for the control of fine particulate (PM_{2.5}) has been proposed of 25 µg/m³.

These have been further supported through guidance documents, such as “Technical Guidance Note MH17: Monitoring of particulate matter in ambient air around waste facilities” (Environment Agency, 2004) and the “Minerals Policy Statement (MPS) 2, Annex 1: Dust (ODPM,2005).

However, in more recent years a sharp focus on construction and demolition sites within urban areas has been brought about, with particular attention being given in large cities. This has culminated in the release of “The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance”, Greater London Authority 2006 and its supplementary planning guidance note released in 2014. Under these documents it is stated that:

“All demolition and construction sites should be monitored for the generation of air pollution. It is essential to monitor for dust generation, including PM₁₀. For smaller sites this can be simply visual monitoring. The need to monitor PM_{2.5} and NO₂ will be determined on a case-by-case basis by the local planning authority. The need for monitoring will generally depend on existing air quality, air pollution risks from the development, the technical practicalities and financial implications of such monitoring.”

The aim of such guidance is to reduce the levels of PM₁₀ (inhalable) and PM_{2.5} (respirable), as their impact on health is substantial. These can both potentially increase incidence of pneumonia and exacerbate chronic obstructive pulmonary disease, asthma attacks and broncho-dilator use. Other risks include increased respiratory symptoms, such as coughs, decreased lung function and life expectancy.

As such, these sites are required to look in depth at their impact on the local air quality. This is achieved through the ‘Evaluation of Dust and Air Quality’ and the drawing up of a scheme of works to minimise and protect neighbours, which should to be prepared and submitted to the relevant local authority for approval. Within this, methods to minimise the sites impact on local air quality, such as vehicle type and movement, water supply for dust mitigation and plans to deal with debris should be considered. Specific methods for reducing emissions of dust are also set out.

A crucial part of maintaining good air quality is achieved through continuous, high frequency and real-time site monitoring for the generation of dust fractions PM₁₀ and PM_{2.5}. This should be active during site operations to observe site emissions and ensure compliance with planning conditions. This form of monitoring is agreed with the local authority. The threshold value is normally initially set at 150 µg/m³ for PM₁₀ over a 15 minute period.

The recommended course of action is to determine prevailing wind direction across the site, the setting out of a line across the site according to the direction of the prevailing wind and operate a minimum of two automatic particulate monitors to measure PM₁₀ levels at either end of the line - either inside or outside the site boundary. These instruments should provide data that can be downloaded in real-time by the local authority.

To cater for the latest requirements, Shawcity has set up a number of key partnerships with leading developers and manufacturers of revolutionary live dust monitoring technology for the simultaneous monitoring of PM₁₀, PM₄, PM_{2.5} and PM₁.

As an example, TSI has just released the Environmental DustTrak™ Aerosol Monitor. It offers remote live dust level monitoring through cloud services, with the ability to set threshold values to initiate automated text message and email alarms. This means remedial action can be taken promptly to ensure dust levels do not exceed site emission limits. This revolutionary equipment provides an unsurpassed level of flexibility and affordability in comparison to previous options for live dust monitoring.