

## Suspended Particulate Matter Definition - SPM and RSPM

There is much confusion about how to define PM<sub>10</sub> particulate, but if articles indicate the definitions they used then the information can be compared with information from other studies. A concern is that the dust measurement equipment for PM<sub>10</sub> particulate matter might not be designed to meet the same defined standard as used in the articles which could lead to some discrepancies.

Definitions of PM<sub>10</sub> and respirable dust vary from

- Particulate Matter with diameters less than 10 micron. Not one particle collected may be above 10 micron, regardless of shape and density.
- Particulate Matter with an aerodynamic diameter less than 10 micron. This takes density and shape into account.
- Particulate Matter with a d<sub>50</sub> aerodynamic diameter of less than 10 micron. This takes density, shape and statistical averaging into account.
- Particulate Matter with a d<sub>50</sub> aerodynamic diameter of less than 7 micron (Mining in South Africa). This is just a lower cut off used in the South African Mining Sector of South Africa when determining respirable dust levels on workers working on the mines.

Similar confusion exists for the PM<sub>2.5</sub> particulate definitions and the equipment used to determine these low particle sizes need to be well maintained and operated by experienced people to prevent contamination of the samples by particulate larger than the defined size.

The fact that respirable suspended particulate matter is more dangerous to health than larger particulate up to 100 micron is well established. It is important to remember though that the ratio of RSPM to SPM will be specific to an area and the measurement of the one should be able to infer the other if the ratio has been experimentally determined, (excluding air pollution modelling).

At some stage the definition should be standardised so that apples can be compared to apples.

DustWatch particulate matter equipment measures SPM (suspended particulate matter), and is designed to have a cut-off at 100 micron, so that the maximum particle size collected is as close to 100 micron as possible. The d50 of the samples is between 35 and 45 micron depending on the sampling location. This is not an aerodynamic diameter as the size is determined using a Malvern particle size analysis. So the d50 is the size of particle without taking density and shape into account.

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