

Air pollution factsheet

PM_{2.5}

Relative Size of Particulate Matter

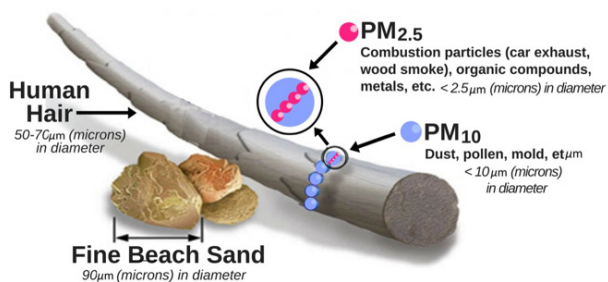


Image credit: US EPA

What is PM_{2.5}?

The term PM_{2.5} stands for Particulate Matter less than 2.5 microns in diameter.

These very fine organic and inorganic particles, a tiny fraction of the width of a human hair, come from a variety of natural and anthropogenic sources and can reach deep into the lungs when inhaled. They are extremely dangerous to human health.

Primary sources of PM_{2.5} include combustion processes, diesel generators, residential heating systems, vehicle exhaust emissions (especially older diesel vehicles), wood smoke from wood-burners and secondary sources such as atmospheric ammonia reactions (from agricultural fertiliser application). Other sources can be naturally occurring i.e. dust, ash and sea-spray.

Why measure it?

Inhalation of particulate pollution can have adverse health impacts, and it is understood to be no safe threshold below which no adverse effects would be anticipated.

The biggest impact of particulate air pollution on public health is understood to be from long-term exposure to PM_{2.5}, which increases the age-specific mortality risk, particularly from cardiovascular causes. PM_{2.5} is one of the most dangerous types of modern, urban air pollution and is therefore very much a priority for mitigation and reduction as well as increased real-time measurement using quality assured instruments.

How to measure PM_{2.5}

There are many ways to measure PM_{2.5} across a wide range of price-points and quality levels. It should be noted that the gold standard CEN reference method (EN 14907) for PM_{2.5} measurement is based on a gravimetric, non-real time sampler and all MCERTS and Defra MCERTS real-time instruments have to demonstrate 'equivalence' to this manual reference method.

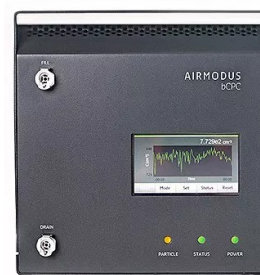
Enviro Technology offers an extensive range of real-time, and near real-time PM_{2.5} monitoring solutions ranging from small, portable, low power (including solar) 'indicative' monitors which can be wall or lamppost mounted (or even used in vehicles or backpacks etc.), through to larger and more sophisticated MCERTS and Defra MCERTS certified instruments that are typically used in air quality monitoring stations for LAQM and AURN reporting purposes.

We can also offer a range of optical multi-channel instruments (including hand-held) that can measure several PM fractions simultaneously (i.e. TSP, PM₁₀, PM₅, PM_{2.5}, PM_{1.0}) as well as a range of cutting-edge instruments for ultra-fine and nano particles, primarily for scientific research applications.

Click here to see our range of hand-held, multi channel particulate instruments.

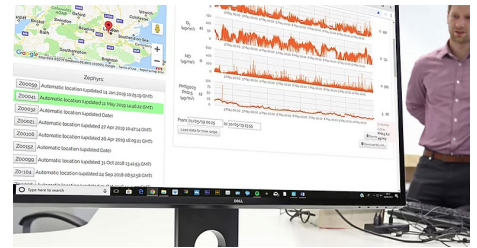


Click here to see our range of instruments for ultra-fine and nano particles.



Indicative Monitors

The Zephyr is a compact and portable air pollution sensor that measures multiple gases and particulate matter formed from harmful emissions. It was designed and built by an experienced development team, and is based on years of academic research.



Zephyr Air Quality Sensor

Indicative MCERTS Monitors

The E-SAMPLER provides real-time particulate measurement by laser light-scattering and also deposits onto a 47mm filter.

Met One E-Sampler



The ES-642 is a nephelometer which automatically measures real-time airborne $PM_{2.5}$ or PM_{10} or TSP particulate concentration levels.

Met One ES-642



MCERTS Monitors

The GRIMM EDM180 is the leading Automated Measuring System (AMS) for measuring particulate matter concentration $PM_{2.5}$ (& PM_{10}) in ambient air.



Grimm EDM180



DEFRA MCERTS Monitors

The BAM 1020 automatically measures and records airborne particulate concentration levels (in milligrams or micrograms per cubic meter) using the industry-proven principle of beta ray attenuation.



BAM-1020 Continuous Beta-Attenuation Particulate Monitor

Our useful comparison table will enable to you see which option best suits your requirements.

	Housed		Wall / post mounted		
	BAM-1020	EDM180	E-Sampler	ES-642	Zephyr
MCERTS approved	✓	✓	✓	✓	✗
Classification	DEFRA MCERTS	MCERTS	Indicative MCERTS	Indicative MCERTS	Indicative (Non MCERTS)
*Lowest Detection Limit (LDL)	< 1.0 µg/m³ (24 hour)	0.1 µg/m³	3 µg/m³	1 µg/m³	5 µg/m³
Ranges	0.1 mg to 10 mg	0 - 10 000 µg/m³	0 - 65 mg/m³	0 to 100 mg/m³	0 - 20,000 µg/m³
Dimensions / mm (H x W x D)	310 x 430 x 400	364 x 483 x 266	650 x 270 x 165	229 x 178 x 108	235 x 160 x 114
Weight	24.5kg	18kg	6.4kg	2.27kg	1.8kg
12V DC / Mains / Solar	Mains	Mains	YES (All)	Mains & Solar	YES (All)
Can measure other PM sizes *Consult ET Sales	*YES	YES	*YES	*YES	YES
Can measure gases	NO	NO	NO	NO	YES
Simultaneous size fraction measurement	NO	YES	NO	NO	YES
Internal zero span for automatic calibration and calibration checking	Auto reference span check	NO	Auto Zero	Auto Zero	NO
Internal data logging	YES	YES	YES	NO	YES
Web / Wi-Fi enabled	NO	NO	NO	NO	YES

Limit values (UK except Scotland) 25 µg/m³ measured as annual mean.

Limit values Scotland 10 µg/m³ measured as annual mean.



Contact us for more information on how we can help you monitor PM_{2.5}

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