January 8, 2026

Sensorbee Pro2 Position Statement on PM10 Monitoring Accuracy, High-Concentration Events, and Humidity Robustness

For construction, demolition, industrial and temporary site monitoring

Why we are publishing this statement

In the UK, PM10 monitoring around construction and demolition sites is commonly managed using short-term action levels to trigger site interventions. The IAQM's 2018 guidance recommends either a site-specific action level or a generic **1-hour PM10 action level of 190 µg/m³**, above which an alert should be sent to the site manager—making reliable, real-time detection around this threshold critical for defensible dust management.

In **September 2025**, the IAQM published a Position Statement highlighting a valid concern: **some low-cost/indicative PM10 systems used around construction sites can under-report PM10 during elevated dust events**, particularly as concentrations approach or exceed **190 µg/m³**, meaning local pollution events may go undetected and dust management actions may not be triggered as intended. The IAQM also notes likely contributing factors, including sensors and/or algorithms developed mainly at concentrations below the action level, and approaches that exclude very high readings to remove confounding effects such as **fog/water particles**.

Sensorbee supports the intent behind the IAQM Position Statement: users need monitoring that is **fit-for-purpose, transparent, and evidence-led**, especially where PM10 can exceed typical ambient ranges (the IAQM notes that indicative certification and typical measurement ranges may be below the 190 µg/m³ action level) and where humidity can affect optical measurements. This statement therefore summarises what Sensorbee Pro2 is certified for and the additional supporting evidence available regarding elevated PM10 and humidity, so customers can use Sensorbee data confidently for dust management and reporting.

Summary of our position

Sensorbee Pro2 is MCERTS certified as an Indicative Ambient Particulate Monitor for **PM2.5 and PM10**.

We recognise that construction and demolition activities can produce **short-term, high-concentration PM10 events**. We therefore back up the MCERTS certification with additional evidence:

1. **MCERTS independent certification and long field assessment**, with Sensorbee Pro2 units collocated alongside reference instrumentation during certification testing. [Ref. 1]

2. **High-concentration linearity evidence** for the underlying NextPM sensor element used in Sensorbee Pro2, including PM10 linearity up to approximately **1,400 µg/m³** with near-perfect linear correlation in test data shared by the sensor manufacturer.
3. **Independent, peer-reviewed evidence** indicating the NextPM sensor is **less affected by humidity and water aerosols** than a comparable optical sensor, with improved stability and fewer extreme humidity-related artefacts. [Ref. 4]

Our aim is not to claim "reference-equivalent" performance from an indicative monitor. Instead, our aim is to ensure customers can **trust Sensorbee Pro2 for dust management, alarms, trend analysis, and defensible operational decision-making**, and understand what additional steps are required when a project specification demands quantitative, site-calibrated reporting.

What MCERTS certification means for Sensorbee Pro2

What the certification confirms

The Sensorbee Pro2 has been assessed and certified against the **MCERTS Performance Standards for Indicative Ambient Particulate Monitors** (Environment Agency, August 2017, version 4), and is certified for **PM2.5 and PM10**. [Ref. 1]

The MCERTS certificate also documents the **certified configuration**, including the PM sensor type/firmware and the Sensorbee firmware/algorithm version that must be used for the certification to apply. [Ref. 1]

What MCERTS certification does not claim

The MCERTS certificate is explicit that Indicative Ambient Particulate Monitors are field tested at **typical ambient concentrations** (commonly urban background or traffic environments), and the scope of certification is limited to the magnitude and composition experienced during those tests. [Ref. 1]

This is important: **construction sites can exceed typical ambient concentrations** and can contain different particle characteristics (coarse mineral dust, irregular shapes, varying density). Sensorbee therefore treats MCERTS as a **critical baseline**—and supplements it with additional evidence and clear guidance on fit-for-purpose use.

How Sensorbee Pro2 measures PM10

Sensorbee Pro2 measures particulate matter using an **optical particle counting / light scattering approach**. In general terms:

- an air sample is drawn through the measurement zone,
- particles scatter light from a controlled light source,
- the sensor counts particles in size-related bins,
- PM mass concentrations (PM1 / PM2.5 / PM10) are estimated from the particle size distribution.

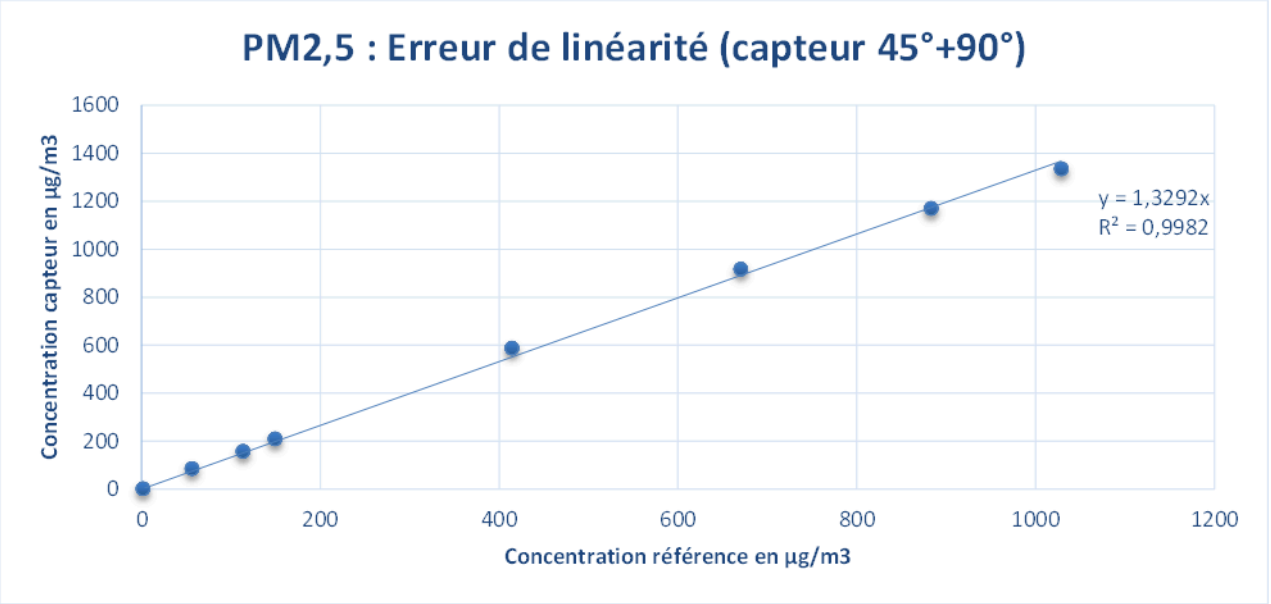
This method is widely used because it provides high time resolution and is well suited to **dust event detection**, alerting, and trend monitoring. However, it is also well understood that coarse particle

measurement can be more challenging than fine particle measurement due to irregular particle shape, composition, and humidity effects.

Addressing the main concerns raised about high PM10 monitoring

Concern: Under-reporting or saturation at high PM10 concentrations

Our response: We provide evidence that the PM sensing element used in Sensorbee Pro2 shows strong linearity well above typical site action thresholds.



In manufacturer-supplied test data for the NextPM sensor (used in the certified Sensorbee Pro2 PM configuration), PM10 response remains strongly linear across a wide concentration range, with a reported best-fit line of approximately:

- **PM10: y = 1.0474x; R^2 = 0.999**, up to around **1,400 µg/m³** reference concentration.

This matters for site monitoring because the commonly referenced **190 µg/m³ (1-hour) action level** sits far below the upper region of the demonstrated linear response in these tests.

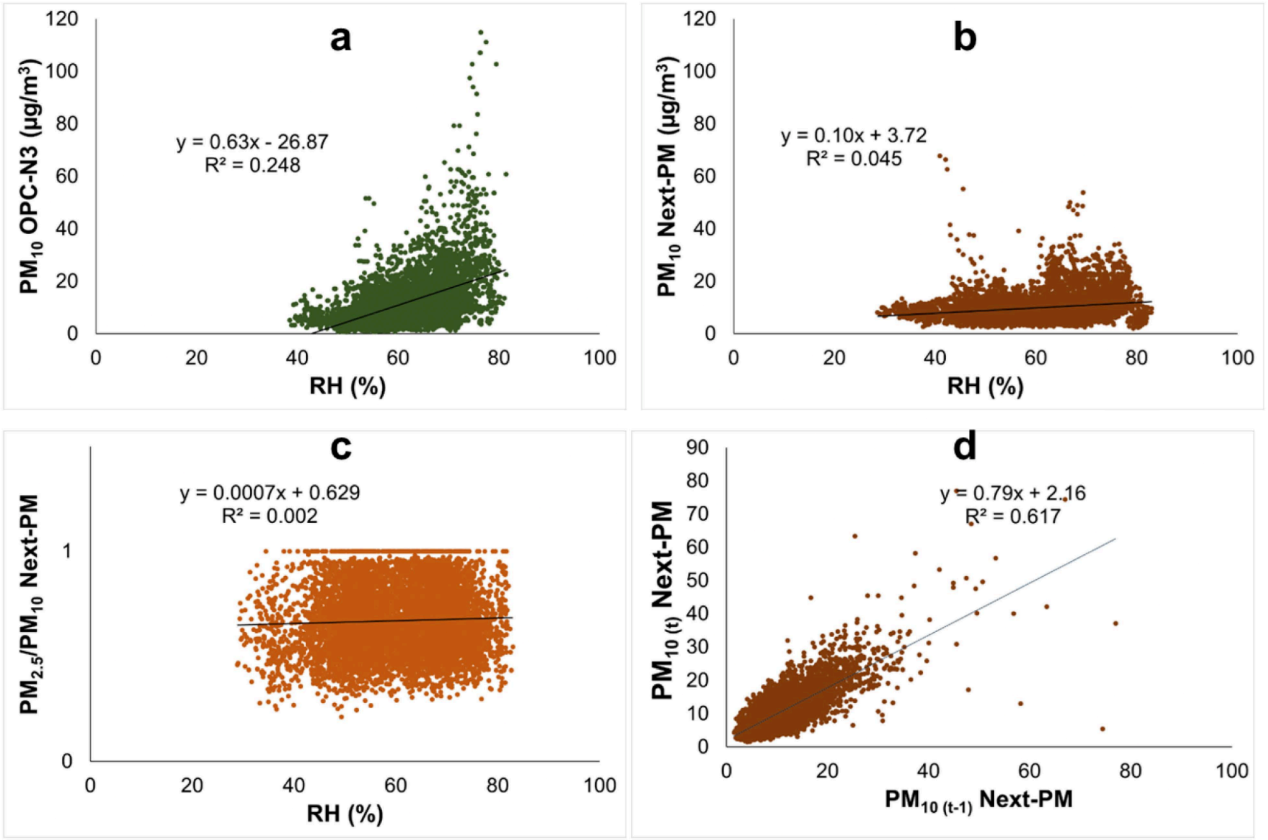
Important clarification: These linearity plots are not a substitute for MCERTS certification testing, and test performance can depend on aerosol type, test setup, and particle properties. The value of this evidence is that it addresses a core technical question: **does the sensor element remain responsive and broadly linear at elevated concentrations, rather than saturating or collapsing?**

Concern: Humidity, fog, and water aerosols causing false spikes or distorted PM10

Our response: We provide independent evidence that the NextPM sensor shows improved robustness to humidity and water aerosol interference compared to an alternative optical particle counter design.

	AM2315	AM2315	OPC-N3	Next PM	OPC-N3	Next PM
	T [°C]	RH [%]	$PM_{2.5}$ [µg/m³]	$PM_{2.5}$ [µg/m³]	PM_{10} [µg/m³]	PM_{10} [µg/m³]
Sample size	431	431	431	431	431	431
Average	20.87	5.65	**1.17**	**1.73**	**5.86**	**2.18**
Standard deviation	1.15	1.15	1.48	1.66	13.51	2.13
Number of extremes	0.0	4.0	13.0	0.0	20.0	19.0
Minimum	18.9	3.6	0.0	0.0	0.0	0.0
Maximum	22.8	12.8	17.8	8.3	103.3	11.3
Skewness	0.04	2.10	6.20	1.66	3.54	1.88
Kurtosis	−1.17	13.11	58.19	2.70	14.96	3.98

Peer-reviewed water aerosol / humidity robustness evidence. *Water aerosol experiment summary: NextPM shows substantially lower PM10 maxima than a comparator optical particle counter in a water aerosol challenge, indicating improved resistance to humidity-related artefacts*



Peer-reviewed field analysis: relationship between PM10 and RH shows a weaker RH-dependence for NextPM than for the comparator sensor in the presented analysis

A peer-reviewed benchmarking study published in *Atmosphere* (2025) compared the NextPM sensor against the Alphasense OPC-N3 under:

- clean air conditions,
- a controlled **water aerosol** experiment (to test susceptibility to non-solid aerosols), and
- a 27-day tropical field deployment.

Key findings in that paper include:

- the NextPM sensor showed **lower noise**, fewer outliers, and **more consistent performance** across conditions;

- in the **water aerosol experiment**, NextPM recorded far lower PM10 maxima than the comparator sensor (indicating reduced false response to water aerosols); [Ref. 4]
- the paper discusses that the NextPM behaviour may be explained by the presence of an internal heater and conditioning approach, and shows a weaker relationship between RH and PM10 for NextPM than for the comparator in the presented analysis. [Ref. 4]

What this means for customers: humidity is a known challenge for optical PM measurement, but credible independent data exists showing that the NextPM sensing approach is comparatively less sensitive to humidity-driven artefacts than some other low-power optical counters.

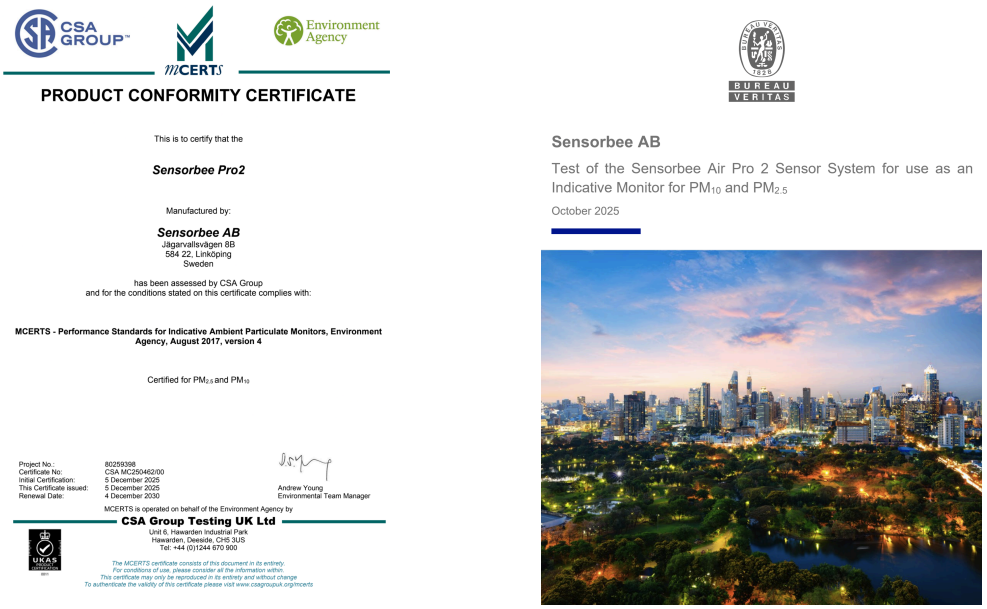
Deployment and best-practice recommendations

To maximise confidence and usefulness of PM10 monitoring on sites, we recommend:

- **Use a network, not a single point.** Perimeter and upwind/downwind comparisons improve interpretability and support source attribution.
- **Use alert levels as part of a dust management plan.** Monitoring should connect directly to operational actions (suppression, activity changes, investigation).
- **Maintain clear documentation.** Record sensor locations, heights, inlet condition, and any changes.
- **Treat PM10 as indicative unless the project includes site calibration.** This is not a limitation unique to Sensorbee; it is the nature of indicative monitoring and is explicitly described within MCERTS.

Our commitment

Sensorbee provides a reliable, transparent solution for construction-site PM10 monitoring. In response to IAQM concerns about missed high-PM10 events near 190 µg/m³, Pro2 is MCERTS-certified and engineered for humidity robustness and peak integrity. If you require additional technical information, evidence packs, please contact Sensorbee.



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Sensorbee Pro2

Manufactured by:

Sensorbee AB
Jägarvallsvägen 8B
584 22, Linköping
Sweden

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:

MCERTS - Performance Standards for Indicative Ambient Particulate Monitors, Environment Agency, August 2017, version 4

Certified for $PM_{2.5}$ and PM_{10}

Project No.: 80259398
Certificate No: CSA MC250462/00
Initial Certification: 5 December 2025
This Certificate issued: 5 December 2025
Renewal Date: 4 December 2030

Andrew Young
Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by
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Sensorbee AB

Test of the Sensorbee Air Pro 2 Sensor System for use as an Indicative Monitor for PM_{10} and $PM_{2.5}$

October 2025

MCERTS certificate extract: certification field tests included collocation with Palas Fidas 200S reference instrumentation at London Teddington Bushy Park (urban background).

References

Ref. 1 — CSA Group Testing UK Ltd. *MCERTS Product Conformity Certificate: Sensorbee Pro2, Certificate No. CSA MC250462/00 (Initial Certification: 5 December 2025).* *https://www.csagroup.org/wp-content/uploads/MC25046201.pdf*

Ref. 2 — Institute of Air Quality Management (IAQM) (2025) Position Statement: Use of Low-Cost Sensor Systems for PM_{10} in the Vicinity of Demolition and Construction Sites and Considerations of PAS 4023:2023, Version 1.0, September 2025. Available at: https://iaqm.co.uk/wp-content/uploads/2013/02/IAQM-PS-Construction-Monitoring-FINAL-2025.pdf

Ref. 3 —IAQM (2018) Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites, Version 1.1, October 2018. Available at: https://iaqm.co.uk/text/guidance/guidance_monitoring_dust_2018.pdf

Ref. 4 — Alvarez Cruz, A. et al. *Benchmarking Low-Cost Particulate Matter Sensors: Evaluating Performance Under Controlled Environmental Conditions Using Low-Cost Experimental Setups.* Atmosphere, 2025. *https://www.researchgate.net/publication/357995385_Evaluation_of_low-cost_particulate_matter_sensors_OPC_N2_and_PM_Nova_for_aerosol_monitoring*