

The Frisbee Gauge



Frisbee-type dust deposit gauges are widely used in the UK for passive dust monitoring, especially during construction and industrial activities

- The **Stockholm Environment Institute at York** developed a detailed protocol for using dry foam Frisbee gauges.
- Gauges should be placed **1.7 m above ground**, away from obstructions (e.g. buildings, trees) to avoid interference.
- Collection periods typically last **one month**, after which the foam insert and rainwater bottle are processed to calculate deposition rates.
- The **deposition rate** is calculated in **mg/m²/day** using the formula:

$$\frac{(W2-W1) \times 24.7}{T} \text{ mg m}^{-2} \text{ day}^{-1}$$

where

W1 = initial dry weight of filter (in mg)

W2 = final dry weight of filter plus dust (in mg)

and

T = length of exposure period

Where They Can Be Used

- Construction sites (especially near sensitive receptors)
- Industrial zones
- Quarrying and demolition areas
- Urban environments for baseline or compliance monitoring

They're ideal for **site boundary monitoring**, especially when directional data isn't required.

What They Measure (Beyond Dust)

While primarily designed to measure **settled particulate matter**, Frisbee gauges can also capture:

- **Soot and carbon particles**

- **Soil components** (sand, silt, clay)
- **Metals and inorganic salts** (e.g. sea salt)
- **Organic debris** (e.g. pollen, leaves, bird droppings)

These can be analysed further to identify **source apportionment** or **environmental impact**².

Usefulness During Construction Surveys

Frisbee gauges are:

- **Cost-effective** and simple to deploy
- Useful for **baseline surveys** before construction begins
- Valuable for **ongoing compliance monitoring** to detect nuisance dust
- Able to provide **monthly averages** that help assess mitigation effectiveness

However, they **don't provide real-time data**, and results are based on **mass only**, not visibility or colour—factors that influence public perception

Role of Frisbee Gauges in IAQM Monitoring Strategy

- Frisbee gauges are considered **passive deposition samplers**, useful for measuring **settled dust** over time.
- IAQM acknowledges that **no single method is perfect**—Frisbee gauges are best for **quantifying dust fall**, but not for identifying **source direction**.
- They are suitable for **low- to medium-risk sites**, especially where **visual nuisance** or **amenity dust** is a concern rather than health-based PM₁₀/PM_{2.5} thresholds

The **Mayor of London**, through the **Supplementary Planning Guidance (SPG)** titled *The Control of Dust and Emissions during Construction and Demolition*, outlines expectations for dust monitoring—but does **not specifically mandate Frisbee gauges**. Instead, the guidance promotes a **risk-based approach** to dust control, referencing broader IAQM standards².

Key Points from the SPG

- **Passive deposition gauges** like Frisbee types are **acknowledged** as part of best practice for **low-cost, long-term dust deposition monitoring**.
- The SPG encourages **site-specific monitoring strategies**, which may include Frisbee gauges for:
 - **Baseline surveys**
 - **Compliance monitoring**
 - **Responding to complaints**

- Frisbee gauges are often used in conjunction with **sticky pad samplers** and **real-time PM monitors** to meet the SPG's goals of reducing PM₁₀, PM_{2.5}, and NO_x emissions².

Monitoring Expectations in London

- Developers must prepare an **Air Quality Statement** covering demolition, earthworks, construction, and trackout.
- Monitoring should be **proportional to the site's risk level**—Frisbee gauges may be suitable for **medium- to low-risk sites**.
- The SPG supports **early and continuous monitoring**, especially near sensitive receptors like schools or hospitals.

Best Practice Recommendations

- Use **multiple methods** to capture dust deposition, direction, and airborne concentrations.
- Implement **mitigation measures** based on monitoring results.
- Maintain **transparent reporting** to local authorities and communities.

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Email: adrian.t@air1testing.co.uk

Tel 07799626406

