

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

## ***E-Sampler Real Time Aerosol Monitors ES-642 Real Time Aerosol Monitors***

Manufactured by:

### ***MetOne Instruments Inc***

1600 Washington Blvd.  
Grants Pass,  
OR, 97526  
USA

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

**MCERTS Performance Standards for Indicative Ambient Particulate Monitors,  
Version 4 dated August 2017**

Certification ranges:

PM <sub>2.5</sub>	0-150µg/m <sup>3</sup>
PM <sub>10</sub>	0-150µg/m <sup>3</sup>

Project No.: 80190317  
Certificate No: CSA MC130241/05  
Initial Certification: 09 December 2013  
This Certificate issued: 04 December 2023  
Renewal Date: 10 December 2028



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Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

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**Approved Site Application**

Any potential user should ensure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency Monitoring Technical Guidance Notes available at [www.mcerts.net](http://www.mcerts.net)

The field test was conducted on a site representative of urban background particulate loading.

The indicative dust monitoring analyser(s) can be operated in one of two ways:

For qualitative measurements: Providing qualitative measurement data for the analysis of particulate pollution trends, and source identification studies based for example on pollution roses etc. Such application can rely on instrument factory calibration only.

For quantitative measurements: Providing measurement data with the uncertainty defined for indicative instruments (+/- 50%). This can be achieved on condition that each instrument used for measurement has been calibrated on the specific site where monitoring is taking place against a standard reference method for a period of two weeks and the resulting slope and intercept have been used for instrument calibration. Using non-standard filters and procedures for this purpose is not acceptable. To maintain the validity of data this calibration has to be repeated at least every twelve months or when the instrument is moved to a different site.

They cannot be used on national automatic monitoring networks for compliance reporting against the Ambient Air Quality Directives.

**Basis of Certification**

This certification is based on the following test report(s) and on CSA Group’s assessment and ongoing surveillance of the product and the manufacturing process:

Bureau Veritas Report: AGGX3951580/BV/DH/2764: Test of E-Sampler for use as an Indicative Monitor for PM<sub>10</sub> and PM<sub>2.5</sub> dated July 2012

Sira Report: 16A30898 dated 11/05/2015

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## Product Certified

The measuring system consists of the following parts:

- E-Sampler or ES-642
- For PM2.5, a bespoke PM2.5 Sharp Cut Cyclone (SCC) designed for a 2 LPM flow rate
- For PM10, a bespoke PM10 Sharp Cut Cyclone (SCC) designed for a 2 LPM flow rate

This certificate applies to all instruments fitted with software version 3693-01 R1.17.1 and serial number J10143 onwards.

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### Certified Performance

Test	Result	MCERTS specification
Constancy of the sample volumetric flow	<±3%	Remain constant within ±3% of rated value
Tightness of the sampling system	0.9%	Leakage not to exceed 2% of sampled volume
Maintenance Interval	Monthly	Two weeks

#### PM<sub>2.5</sub> E-Sampler 24 hr averages

Test	Result	MCERTS specification
Intra-instrument uncertainty for the candidate method		
All data	0.97 µg/m <sup>3</sup>	≤5µg/m <sup>3</sup>
≥ 12.5 µg/m <sup>3</sup>	1.47 µg/m <sup>3</sup>	
≤ 12.5 µg/m <sup>3</sup>	0.64 µg/m <sup>3</sup>	
Highest resulting uncertainty estimate comparison against data quality objective after slope and intercept correction (Measurement Uncertainty)	23.82%	WCM≤Wd <sub>qo</sub> Measurement uncertainty defined as 50% for indicative instruments

#### PM<sub>10</sub> E-Sampler 24 hr averages

Test	Result	MCERTS specification
Intra-instrument uncertainty for the candidate method		
All data	1.55 µg/m <sup>3</sup>	≤5µg/m <sup>3</sup>
≥ 25 µg/m <sup>3</sup>	2.45 µg/m <sup>3</sup>	
≤ 25 µg/m <sup>3</sup>	1.48 µg/m <sup>3</sup>	
Highest resulting uncertainty estimate comparison against data quality objective after slope and intercept correction (Measurement Uncertainty)	20.62%	WCM≤Wd <sub>qo</sub> Measurement uncertainty defined as 50% for indicative instruments

**Note:** The criteria for data split used in the Bureau Veritas report, July 2012, AGGX3951580/BV/DH/2764 were taken from the MCERTS July 2009 specification rather than from the more recent version of MCERTS July 2012. Given that the between sampler/instrument uncertainties calculated for both PM<sub>10</sub> and PM<sub>2.5</sub> are much below the required 5µg/m<sup>3</sup> the relatively minor differences in the processed data split will not result in exceedance of the pass-fail criteria.

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## Description

The E-Sampler is a dual technology instrument combining the near-forward light scattering real time particulate measurements with the filter method. Particulate loading of the filter does not affect the light scattering unit performance due to operation of the flow control system.

An internal rotary vane pump draws air the rate of 2 LPM into the sensing chamber of the instrument where it passes through the visible laser light. The instruments are equipped with bespoke 2 LPM cyclones for PM<sub>2.5</sub> and PM<sub>10</sub>.

Ambient temperature and pressure are measured and the actual flow is calculated and controlled by the internal microprocessor making it independent of the filter charge.

Due to its principle of operation it can measure and report data at one to sixty minute intervals. Longer averaging results are produced by electronic processing of data.

The ES-642 Aerosol Monitor is a compact version of the E-Sampler. The ES-642 and E-Sampler share the same particulate measurement and flow control components. The ES-642 is a real time only measurement so it does not contain a data logger or a filter method.

## General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this certificate. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.
2. The design of the product certified is held and maintained by TÜV Rheinland for certificate No. CSA MC130241/05.
3. If a certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.
4. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.
5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.

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