

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000037055_03

Certified AMS: BAM 1020 with PM₁₀ pre-separator for suspended particulate matter, PM₁₀ fraction

Manufacturer: Met One Instruments Inc.
1600, Washington Blvd.
Grants Pass, Oregon 97526,
USA

Test Institute: TÜV Rheinland Energy & Environment GmbH

**This is to certify that the AMS has been tested
and found to comply with the standards
VDI 4202-3 (2019), EN 12341 (1999), EN 16450 (2017),
Guide for Demonstration of Equivalence of Ambient Air Monitoring Methods (2010),
EN 15267-1 (2009) and EN 15267-2 (2009).**

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 16 pages).
The present certificate replaces certificate 0000037055_02 dated 12 June 2019.

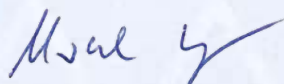


Publication in the German Federal Gazette
(BAnz) of 20 April 2007

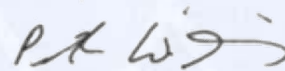
German Environment Agency
Dessau, 20 March 2024

This certificate will expire on:
25 March 2029

TÜV Rheinland Energy &
Environment GmbH
Cologne, 13 March 2024



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51105 Köln

Test institute accredited to EN ISO/IEC 17025 by DAkkS (German Accreditation Body).
This accreditation is limited to the accreditation scope defined in the enclosure to the certificate D-PL-11120-02-00.

Test report:	936/21205333/A dated 6 December 2006 and Addendum No. 936/21220762/A dated 4 October 2012 and Addendum 936/21243375/B dated 21 September 2018
Initial certification:	5 March 2013
Expiry date:	25 March 2029
Certificate:	Renewal (of previous certificate 0000037055_02 of 12 June 2019 valid until 25 March 2024)
Publication:	BAnz. 20 April 2007, No. 75, p. 4139, chapter III No. 1.2 and BAnz AT 26.03.2019 B7, chapter IV notification 42

Approved application

The tested AMS is suitable for continuous ambient air monitoring of suspended particulate matter, PM₁₀ (stationary operation).

The suitability of the AMS for this application was assessed on the basis of a laboratory test and field tests (initial testing) at three different locations and periods as well as equivalence assessments taking into account seven different locations and periods.

The AMS is approved for an ambient temperature range of +5 °C to 40 °C.

The notification of suitability of the AMS, performance testing and the uncertainty calculation have been effected on the basis of the regulations applicable at the time of testing. As changes in legal provisions are possible, any potential user should ensure that this AMS is suitable for monitoring the measured values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended use.

Basis of the certification

This certification is based on:

- Test report 936/21205333/A dated 6 December 2006 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and Addendum No. 936/21220762/A dated 4 October 2012 of TÜV Rheinland Energie und Umwelt GmbH and Addendum 936/21243375/B dated 21 September 2018 of TÜV Rheinland Energy & Environment GmbH
- Suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- The ongoing surveillance of the product and the manufacturing process

Publication in the German Federal Gazette: BAnz. 20 April 2007, No. 75, p. 4139, chapter III
No. 1.2, Announcement by UBA dated 12 April 2007:

AMS designation:

BAM-1020 with PM₁₀ pre-separator

Manufacturer:

Met One Instruments Inc., Grants Pass, USA

Field of application:

For continuous ambient air monitoring of suspended particulate matter, PM₁₀ (stationary operation)

Measuring ranges during the performance test:

Suspended particulate matter PM₁₀ 0 - 1.0 mg/m³ = 0 - 1,000 µg/m³

Software version:

3236-02 3.2.1b

Notes:

1. For monitoring PM₁₀, the instrument must be fitted with the following options: Sample heater (BX-830), sampling head (BX-802), ambient temperature sensor (BX-592) and pressure sensor (BX-594).
2. The heater may only be used in the manner it was used during performance testing.
3. Flow control must be related to operational flow considering ambient conditions (operating mode: ACTUAL).
4. Over the entire period of testing, the instrument was operated with the BX-830 sample heater.
5. During the performance test, the cycle time was 1 h, i.e. the filter was automatically changed once an hour. Every filter spot was sampled only once.
6. The measuring system must be operated inside a lockable measurement container.
7. The measuring system must be calibrated on site at regular intervals by using the gravimetric PM₁₀ reference method according to EN 12341.

Test Institute:

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Report No.: 936/21205333/A dated 6 December 2006

Publication in the German Federal Gazette: BAnz. 25. August 2009, No. 125, p. 2929, Chap. III, notification 6, Announcement by UBA dated 03 August 2009:

6 Notification as regards Federal Environment Agency notice of 12 April 2007 (BAnz. p. 4139)

The current software version of the BAM-1020 measuring system manufactured by Met One Instruments, Inc. is:

Version 3236-02 5.0.2

Notice 1 correctly reads as follows:

1. For monitoring PM₁₀, the instrument must be fitted with the following options at least:
Sample heater (BX-830), sampling head (BX-802) and ambient temperature sensor (BX-592).

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 30 March 2009

Publication in the German Federal Gazette: BAnz. 12 February 2010, No. 24, p. 552, Chap. IV, notification 10, Announcement by UBA dated 25 January 2010:

10 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. p. 4139) and of 3 August 2009 (BAnz. p. 2935)

The current software version of the BAM-1020 measuring system manufactured by Met One Instruments is:

Version 3236-07 V5.0.5

Notice 1 is replaced as follows:

1. For monitoring PM₁₀, the instrument must be fitted with the following options at least:
Sample heater (BX-830), sampling head (BX-802) and ambient temperature sensor (BX-592) or combined temperature and pressure sensor (BX-596).

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 9 October 2009

Publication in the German Federal Gazette: BAnz. 12. February 2010, No. 24, p. 552, Chap. IV, notification 11, Announcement by UBA dated 25 January 2010:

11 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. p. 4139) and of 3 August 2009 (BAnz. p. 2935)

An identical instrument to the BAM-1020 measuring system manufactured by Met One Instruments, TÜV Report No. 936/21205333/A dated 6 December 2006, is distributed by HORIBA Europe GmbH, 61440 Oberursel, under the name APDA-371.

The current software version of the APDA-371 ambient air quality measuring system is:

Version 3236-07 V5.0.5

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 9 October 2009

Publication in the German Federal Gazette: BAnz. 28. July 2010, No. 111, p. 2597, Chap. III notification 2, Announcement by UBA dated 12 July 2010:

2 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. p. 4139) and of 25 August 2010 (BAnz. p. 555)

The current software version of the BAM-1020 measuring system with PM₁₀ pre-separator manufactured by Met One Instruments is:

Version 3236-07 V5.0.10

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 16 March 2010

Publication in the German Federal Gazette: BAnz. 29. July 2011, No. 113, p. 2725, Chap. III notification 12, Announcement by UBA dated 15 July 2011:

12 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. S. 4139, chapter III number 1.2) and of 12 July 2010 (BAnz. p. 2597, Chapter III notification 2)

The BAM-1020 measuring system with PM₁₀ pre-separator manufactured by Met One Instruments, Inc. measuring suspended particulate matter PM₁₀ may also be operated with a BX-125 pump.

The measuring system may optionally be equipped with a touch screen display (BX-970 option).

The current software version is:

3236-77 V5.1.0

The software version of the measuring system without the BX-970 touch screen option remains unchanged: 3236-07 5.0.10.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH
dated 24 March 2011

Publication in the German Federal Gazette: BAnz AT 20.07.2012 B11, Chap. IV notification 6, Announcement by UBA dated 6 July 2012:

6 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. S. 4139, chapter III number 1.2) and of 15 July 2011 (BAnz. p. 2725, Chapter III notification 12)

The BAM-1020 measuring system with PM₁₀ pre-separator manufactured by Met One Instruments, Inc. measuring suspended particulate matter PM₁₀ was equipped with a re-designed back plate, which makes room for additional interfaces such as the optional BX-965 reporting process.

The current software version of the measuring system is:

3236-07 5.0.15

The current software version of the measuring system with the touch screen display (option BX-970) is:

3236-77 V5.1.2

Statement issued by TÜV Rheinland Energie und Umwelt GmbH
dated 21 March 2012

Publication in the German Federal Gazette: BAnz AT 05.03.2013 B10, Chap. V notification 2,
Announcement by UBA dated 12 February 2013:

2 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. S. 4139, chapter III number 1.2) and of 6 July 2012 (BAnz AT 20.07.2012 B11, chapter IV notification 6)

The BAM-1020 measuring system with PM₁₀ pre-separator for suspended particulate matter, PM₁₀ fraction, manufactured by Met One Instruments, Inc. complies with the requirements of standard EN 12341 (March 1998 version) and those of guideline "Demonstration of Equivalence of Ambient Air Monitoring Methods", version dated January 2010. Moreover, the manufacturing process and the QMS used for the BAM-1020 measuring system with PM₁₀ pre-separator meet the requirements specified in standard EN 15267.

The test report on performance testing No. 936/21205333/A and the addendum to this report No. 936/21220762/A are available online at www.qal1.de.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH
dated 4 October 2012

Publication in the German Federal Gazette: BAnz AT 23.07.2013 B4, Chap. V notification 5,
Announcement by UBA dated 3 July 2013:

5 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. S. 4139, chapter III number 1.2) and of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter V notification 2)

The current software version of the BAM-1020 measuring system with PM₁₀ pre-separator monitoring PM₁₀ manufactured by Met One Instruments is:
3236-07 5.1.1

The current software version of the measuring system with the touch screen display (option BX-970) is:
3236-77 V5.2.0

Statement issued by TÜV Rheinland Energie und Umwelt GmbH
dated 18 March 2013

Publication in the German Federal Gazette: BAnz AT 02.04.2015 B5, chapter IV notification 11, UBA announcement dated 25 February 2015:

11 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. S. 4139, chapter III number 1.2) and of 3 July 2013 (BAnz AT 23.07.2013 B4, chapter V notification 5)

The 970603 pressure sensor (MICROSWITCH #185PC15AT) of the BAM 1020 measuring system with PM₁₀ pre-separator manufactured by Met One Instruments, Inc., is no longer produced and has been replaced by the 970595 pressure sensor (HONEYWELL SSCDANN015PAAA5).

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 20 September 2014

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, Chap. V notification 8, Announcement by UBA dated 21 February 2018:

8 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. S. 4139, chapter III number 1.2) and of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter IV, notification 11)

The current software version of the BAM-1020 measuring system with PM₁₀ pre-separator manufactured by Met One Instruments is:
3236-07 5.5.0

The current software version of the measuring system with the touch screen display (option BX-970) is:

3236-77 V5.2.0

Statement issued by TÜV Rheinland Energy GmbH dated 18 August 2017

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, Chap. IV notification 42, Announcement by UBA dated 27 February 2019:

42 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. S. 4139, chapter III number 1.2) and of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter V notification 8)

In its version without a touch screen display (option BX-970), the BAM-1020 measuring system with PM₁₀ pre-separator monitoring suspended particulate matter PM₁₀ manufactured by Met One Instruments, Inc. meets the requirements of standard EN 16450 (July 2017). An addendum to test report No. 936/21243375/B is available online at www.qal1.de.

The current software version is: 3236-05 3.14.2

The current software version of the measuring system with the touch screen display (option BX-970) is: 3236-77 V5.2.0

Statement issued by TÜV Rheinland Energy GmbH dated 10 January 2019

Publication in the German Federal Gazette: BAnz AT 03.05.2021 B9, Chap. III notification 42, Announcement by UBA dated 31 March 2021:

42 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2007 (BAnz. p. 4139, chapter III number 1.2) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV notification 42)

The latest software version of the BAM-1020 measuring system for suspended particulate matter PM₁₀ manufactured by Met One Instruments, Inc. is: 3236-05 V3.14.3

The latest software version of the measuring system with the touch screen display (option BX-970) is unchanged: 3236-77 V5.2.0.

Statement issued by TÜV Rheinland Energy GmbH dated 10 June 2020

Publication in the German Federal Gazette: BAnz AT 11.04.2022 B10, Chap. VI
notification 17, Announcement by UBA dated 09 March 2022:

**17 Notification as regards Federal Environment Agency (UBA) notices
of 12 April 2007 (BAnz. p. 4139, chapter III number 1.2) and
of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter III notification 42)**

The current software version of the measuring device BAM-1020 for suspended
particulate matter PM₁₀ of the company Met One Instruments, Inc. is:
R9.3.0

In the future, the measuring device will basically have a touch-sensitive screen and
an USB port is now installed in the front panel.

On the rear panel there is now an electrical connection for a new generation of digital
frahling sensors.

In this context, the previous temperature sensor (BX-592) will be replaced with the
digital model BX-598 and the combined pressure and temperature sensor BX-596
will be replaced with the digital model BX-597A, which also measures humidity.

Statement issued by TÜV Rheinland Energy GmbH dated 08 December 2021

**78 Notification as regards Federal Environment Agency (UBA) notices
of 12. July 2010 (BAnz. p. 2597, chapter II number 1.2) and
of 9. March 2022 (BAnz AT 11.04.2022 B10, chapter IV notification 17)**

The current software versions of the BAM-1020 measuring system for particulate
matter PM₁₀ from Met One Instruments, Inc. are as follows:

Version without touch screen 3236-05 3.14.4.

Version with touch-sensitive screen (old screen version) 3236-77 V5.2.0.

Version with touch-sensitive screen (new screen version) R9.5.1

Statement issued by TÜV Rheinland Energy GmbH dated 8. September 2022

Certified product

This certificate applies to automated measurement systems conforming to the following description:

The BAM-1020 measuring system with PM₁₀ pre-separator consists of the PM₁₀ sampling inlet BX-802, the sampling tube, the sample heater BX-830, the ambient temperature sensor BX-592 (incl. radiation protection shield) or the combined pressure and temperature sensor BX-596, the vacuum pump BX-127 or optionally the BX-125, the measuring instrument BAM-1020 (incl. glass-fibre filter tape), the respective connecting tubes and lines as well as adapters, the roof flange as well as the manual in German.

The measuring system uses beta-attenuation as a measurement principle.

The particle sample passes the PM₁₀ sampling inlet at a flow rate of 1 m³/h and reaches the BAM-1020 analyser via the sampling tube.

During performance testing, the measuring system was operated with the BX-830 sample heater.

Particles arrive at the measuring instrument and will be separated by the glass fibre filter tape. During the performance test, the cycle time was set to 60 min, radiometric measurement taking 4 min.

Thus, the cycle time consists of 2 x 4 min for the radiometric measurement (I₀ & I₃) as well as approximately 1–2 min for filter tape movements. Consequently, the effective sampling time is around 50 min.

Furthermore, the measuring system allows an extension of the measuring time to 6 or 8 min in order to increase the precision of the radiometric measurement. Effective sampling time in that case decreases to 46 or 42 min.

The radiometric determination of mass is calibrated in the factory and is checked hourly during operation as part of internal quality assurance at the zero point (clean filter spot) and at the span point (built-in reference foil). Measured values at zero and span points are easily derived from the data generated. These can then be compared to stability criteria (drift) or target values for span (factory settings).

General notes

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. 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 systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energy & Environment GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This certification mark may be applied to the product or used in advertising materials for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energy & Environment GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energy & Environment GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and its expiration is also accessible on the internet: gal1.de.

History of documents

Certification of BAM 1020 PM₁₀ with PM₁₀ pre-separator is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Basic test

Test report: 936/21205333/A dated 6 December 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
Publication: BAnz. 20 April 2007, No. 75, p. 4139, chapter III number 1.2
UBA announcement dated 12 April 2007

Notifications

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 30 March 2009
Publication: BAnz. 25 August 2009, No. 125, p. 2929, chapter III notification 6
UBA announcement dated 3 August 2009
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 9 October 2009
Publication: BAnz. 12 February 2010, No. 24, p. 552, chapter IV notification 10
UBA announcement dated 25 January 2010
(New software version, replacement of notice 1)

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
dated 9 October 2009

Publication: BAnz. 12 February 2010, No. 24, p. 552, chapter IV notification 11
UBA announcement dated 25 January 2010
(Distribution by Horiba Europe GmbH)

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
dated 16 March 2010

Publication: BAnz. 28 July 2010, No. 111, p. 2597, chapter III notification 2
UBA announcement dated 12 July 2010
(Software changes)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 24 March 2011

Publication: BAnz. 29 July 2011, No. 113, p. 2725, chapter III notification 12
UBA announcement dated 15 July 2011
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 21 March 2012

Publication: BAnz AT 20.07.2012 B11, chapter IV notification 6
UBA announcement dated 6 July 2012
(Soft- and hardware changes)

Initial certification according to EN 15267

Certificate No. 0000037055_00: 22 March 2013

Expiry date of the certificate: 04 March 2018

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 4 October 2012

Addendum: 936/21220762/A dated 4 October 2012

Publication: BAnz AT 05.03.2013 B10, chapter V notification 2

UBA announcement dated 12 February 2013

Notifications

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 18 March 2013

Publication: BAnz AT 23.07.2013 B4, chapter V notification 5

UBA announcement dated 3 July 2013

(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 20 September 2014

Publication: BAnz AT 02.04.2015 B5, chapter IV notification 11

UBA announcement dated 25 February 2015

(Hardware changes)

Renewal of certificate

Certificate No. 0000037055_01: 05 March 2018

Expiry date of the certificate: 04 March 2023

Notifications

Statement issued by TÜV Rheinland Energy GmbH dated 18 August 2017

Publication: BAnz AT 26.03.2018 B8, chapter V notification 8

UBA announcement dated 21 February 2018

(Software changes)

Certificate based on a notification

Certificate No. 0000037055_02: 12 June 2019
Expiry date of the certificate: 25 March 2024
Statement issued by TÜV Rheinland Energy GmbH dated 10 January 2019
Addendum: 936/21243375/B dated 21 September 2018
Publication: BAnz AT 26.03.2019 B7, chapter IV notification 42
UBA announcement dated 27 February 2019
(Fulfillment of the requirements according to DIN EN 16450)

Notifications

Statement issued by TÜV Rheinland Energy GmbH dated 10 June 2020
Publication: BAnz AT 03.05.2021 B9, chapter III notification 42
UBA announcement dated 31 March 2021
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 8 December 2021
Publication: BAnz AT 11.04.2022 B10, chapter VI notification 17
UBA announcement dated 9 March 2022
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 8 September 2022
Publication: BAnz AT 20.03.2023 B6, chapter IV notification 78
UBA announcement dated 21 February 2023
(Soft- and hardware changes)

Renewal of certificate

Certificate No. 0000037055_03: 20 March 2024
Expiry date of the certificate: 25 March 2029

Expanded uncertainty PM₁₀

Comparison candidate with reference according to Standard EN 16450:2017			
Candidate	BAM-1020	SN	60 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011
Status of measured values	Slope and offset corrected	Limit value	50 $\mu\text{g}/\text{m}^3$
		Allowed uncertainty	25 %
All comparisons			
Uncertainty between Reference	0.67	$\mu\text{g}/\text{m}^3$	
Uncertainty between Candidates	1.18	$\mu\text{g}/\text{m}^3$	
	SN 4924 / Ö1 / J7860 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011		
Number of data pairs	320		
Slope b	1.000	not significant	
Uncertainty of b	0.008		
Ordinate intercept a	0.009	not significant	
Uncertainty of a	0.280		
Expanded measured uncertainty WCM	12.27	%	
All comparisons, $\geq 30 \mu\text{g}/\text{m}^3$			
Uncertainty between Reference	0.91	$\mu\text{g}/\text{m}^3$	
Uncertainty between Candidates	1.44	$\mu\text{g}/\text{m}^3$	
	SN 4924 / Ö1 / J7860 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011		
Number of data pairs	105		
Slope b	1.007		
Uncertainty of b	0.017		
Ordinate intercept a	-0.652		
Uncertainty of a	0.997		
Expanded measured uncertainty WCM	15.09	%	
All comparisons, $< 30 \mu\text{g}/\text{m}^3$			
Uncertainty between Reference	0.53	$\mu\text{g}/\text{m}^3$	
Uncertainty between Candidates	1.06	$\mu\text{g}/\text{m}^3$	
	SN 4924 / Ö1 / J7860 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011		
Number of data pairs	215		
Slope b	1.079		
Uncertainty of b	0.031		
Ordinate intercept a	-1.187		
Uncertainty of a	0.538		
Expanded measured uncertainty WCM	15.57	%	

Comparison candidate with reference according to Standard EN 16450:2017				
Candidate	BAM-1020	SN	60 / SN 17022 & SN 4925 / O2 / J7863 / SN 17011	
Status of measured values	Slope and offset corrected	Limit value	50	$\mu\text{g}/\text{m}^3$
		Allowed uncertainty	25	%
Cologne, parking lot				
Uncertainty between Reference	0.55	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	1.18	$\mu\text{g}/\text{m}^3$		
	SN 4924		SN 4925	
Number of data pairs	29		29	
Slope b	0.917		0.957	
Uncertainty of b	0.035		0.032	
Ordinate intercept a	1.329		1.789	
Uncertainty of a	0.919		0.834	
Expanded measured uncertainty W_{CM}	15.13	%	9.18	%
Titz-Rödingen				
Uncertainty between Reference	0.65	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	0.83	$\mu\text{g}/\text{m}^3$		
	SN 4924		SN 4925	
Number of data pairs	37		37	
Slope b	1.023		1.021	
Uncertainty of b	0.034		0.034	
Ordinate intercept a	-0.438		0.417	
Uncertainty of a	0.756		0.760	
Expanded measured uncertainty W_{CM}	7.56	%	9.10	%
Cologne, Frankf. Str.				
Uncertainty between Reference	1.02	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	0.96	$\mu\text{g}/\text{m}^3$		
	SN 4924		SN 4925	
Number of data pairs	28		28	
Slope b	0.990		0.988	
Uncertainty of b	0.037		0.034	
Ordinate intercept a	-2.050		-0.951	
Uncertainty of a	1.048		0.962	
Expanded measured uncertainty W_{CM}	13.19	%	9.97	%
Steyregg				
Uncertainty between Reference	0.53	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	0.73	$\mu\text{g}/\text{m}^3$		
	O1		O2	
Number of data pairs	45		45	
Slope b	1.012		0.997	
Uncertainty of b	0.065		0.069	
Ordinate intercept a	-2.439		-2.347	
Uncertainty of a	1.347		1.441	
Expanded measured uncertainty W_{CM}	11.58	%	13.77	%
Graz				
Uncertainty between Reference	0.81	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	1.90	$\mu\text{g}/\text{m}^3$		
	O1		O2	
Number of data pairs	45		45	
Slope b	0.991		0.998	
Uncertainty of b	0.027		0.028	
Ordinate intercept a	-0.979		1.105	
Uncertainty of a	1.787		1.898	
Expanded measured uncertainty W_{CM}	20.77	%	21.63	%
Tusimice				
Uncertainty between Reference	0.95	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	1.15	$\mu\text{g}/\text{m}^3$		
	J7860		J7863	
Number of data pairs	97		96	
Slope b	0.966		1.001	
Uncertainty of b	0.012		0.012	
Ordinate intercept a	2.809		1.160	
Uncertainty of a	0.476		0.446	
Expanded measured uncertainty W_{CM}	11.73	%	11.08	%
Teddington				
Uncertainty between Reference	0.25	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	0.97	$\mu\text{g}/\text{m}^3$		
	SN 17022		SN 17011	
Number of data pairs	40		40	
Slope b	1.073		1.123	
Uncertainty of b	0.033		0.041	
Ordinate intercept a	-0.856		-1.544	
Uncertainty of a	0.473		0.583	
Expanded measured uncertainty W_{CM}	12.31	%	19.52	%
All comparisons, $\geq 30 \mu\text{g}/\text{m}^3$				
Uncertainty between Reference	0.91	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	1.44	$\mu\text{g}/\text{m}^3$		
	SN 4924 / O1 / J7860 / SN 17022		SN 4925 / O2 / J7863 / SN 17011	
Number of data pairs	67		67	
Slope b	1.001		1.032	
Uncertainty of b	0.021		0.022	
Ordinate intercept a	-1.821		-1.648	
Uncertainty of a	1.266		1.34	
Expanded measured uncertainty W_{CM}	17.71	%	17.26	%
All comparisons, $< 30 \mu\text{g}/\text{m}^3$				
Uncertainty between Reference	0.53	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	1.06	$\mu\text{g}/\text{m}^3$		
	SN 4924 / O1 / J7860 / SN 17022		SN 4925 / O2 / J7863 / SN 17011	
Number of data pairs	157		157	
Slope b	1.006		1.055	
Uncertainty of b	0.035		0.039	
Ordinate intercept a	-0.892		-1.223	
Uncertainty of a	0.605		0.675	
Expanded measured uncertainty W_{CM}	9.99	%	12.48	%
All comparisons				
Uncertainty between Reference	0.67	$\mu\text{g}/\text{m}^3$		
Uncertainty between Candidates	1.18	$\mu\text{g}/\text{m}^3$		
	SN 4924 / O1 / J7860 / SN 17022		SN 4925 / O2 / J7863 / SN 17011	
Number of data pairs	224		224	
Slope b	0.985	not significant	1.019	significant
Uncertainty of b	0.009		0.010	
Ordinate intercept a	-0.655	significant	-0.729	significant
Uncertainty of a	0.319		0.346	
Expanded measured uncertainty W_{CM}	13.17	%	12.96	%