Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000056506_03

Certified AMS:	CMM for Hg
Manufacturer:	Gasmet Technologies Oy Mestarintie 6 01730 Vantaa Finland
Test Institute:	TÜV Rheinland Energy & Environment GmbH

This is to certify that the AMS has been tested and found to comply with the standards EN 15267-1 (2009), EN 15267-2 (2009), EN 15267-3 (2007) and EN 14181 (2014).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 11 pages).
The present certificate replaces certificate 0000056506_02 dated 12 June 2019.

TÜVRheinland® CERTIFIED
Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance
www.tuv.com
ID 0000056506

Publication in the German Federal Gazette (BAnz) of 26 March 2019

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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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:	936/21238865/D dated 1 October 2018
Initial certification:	26 March 2018
Expiry date:	25 March 2029
Certificate:	Renewal (of previous certificate 0000056506_02 of 12 June 2019 valid until 25 March 2024)
Publication:	BAnz AT 26.03.2019 B7, chapter I No. 1.1

Approved application
The tested AMS is suitable for use at plants according to Directive 2010/75/EC, chapter III (combustion plants / 13th BImSchV:2017), chapter IV (waste incineration plants / 17th BImSchV:2013), 30th BImSchV:2017, 27th BImSchV:2013 and TA Luft:2002. The measured ranges have been selected so as to ensure as broad a field of application as possible.

The suitability of the AMS for this application was assessed on the basis of a laboratory test, a six-months field test as well as two additional one-month field tests at various plant types.

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 emission limit values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the installation at which it will be installed.

Note:
The legal regulations mentioned correspond to the current state of legislation during certification. Each user should, if necessary, in consultation with the competent authority, ensure that this AMS meets the legal requirements for the intended use. In addition, it cannot be ruled out that legal regulations governing the use of a measuring device for emission monitoring may change during the lifetime of the certificate.

Basis of the certification
This certification is based on:

- Test report 936/21238865/D dated 1 October 2018 of TÜV Rheinland Energy 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 AT 26.03.2019 B7, chapter I No. 1.1, Announcement by UBA dated 27 February 2019:

AMS designation:
CMM for mercury

Manufacturer:
Gasmet Technologies Oy, Helsinki, Finland

Field of application:
For plants requiring official approval and for plants according to the 27th BImSchV

Measuring ranges during the performance test:

Component	Certification range	Supplementary measurement ranges				Unit
Hg	0 - 5	0 - 10	0 - 45	0 - 100	0 – 1.000	µg/m³

Software version:
1.198

Restrictions:
None

Notes:

1. The maintenance interval is three months.
2. Wet test gases should be used for testing Hg.
3. An external test gas generator is needed for regular span checks during the maintenance interval.
4. The sample gas line used in the laboratory test and in the field test at a power plant was 12 m long, it was 25 m long in the field test at a waste incinerator; in the field test at a cement kiln, it was 8 m long.
5. The measuring system needs to be aligned with the zero and span point daily using the integrated Hg(0) generator.
6. Supplementary test (software revision, expansion of the scope of approval to cover plants requiring official approval and plants according to the 27th BImSchV) as regards Federal Environment Agency notice of 3 July 2018 (BAnz AT 17.07.2018 B9, chapter I, number 2.2).

Test Institute:
TÜV Rheinland Energy GmbH, Cologne
Report No.: 936/21238865/D dated 1 October 2018

Publication in the German Federal Gazette: BAnz AT 22.07.2019 B8, Chap. V notification 8, Announcement by UBA dated 28 June 2019:

8 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter I number 2.1) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter I number 1.1)

The new address of Gasmet Technology Oy, manufacturer of the CMM measuring system for mercury, is as follows:
Gasmet Technologies Oy, Mestarintie 6, 01730 Vantaa, Finland

Statement issued by TÜV Rheinland Energy GmbH dated 7 March 2019

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, Chap. IV notification 49, Announcement by UBA dated 24 February 2020:

49 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter I number 2.1) and of 28 June 2019 (BAnz AT 22.07.2019 B8, chapter V notification 8)

The label at the door of the CMM measuring system for Hg manufactured by Gasmet Technology Oy was adapted to the latest corporate design.
The current software version is:

1.2031

This includes versions 1.199, 1.200, 1.201 and 1.202.

Statement issued by TÜV Rheinland Energy GmbH dated 10 September 2019

Publication in the German Federal Gazette: BAnz AT 31.07.2020 B10, Chap. II notification 9, Announcement by UBA dated 27 May 2020:

9 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter I number 2.1) and of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter IV, notification 49)

The latest software version of the CMM measuring system manufactured by Gasmet Technology Oy is:

1.204

Statement issued by TÜV Rheinland Energy GmbH dated 12 March 2020

Publication in the German Federal Gazette: BAnz AT 03.05.2021 B9, Chap. III
notification 32, Announcement by UBA dated 31 March 2021:

32 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter I number 2.1) and of 27 May 2020 (BAnz AT 31.07.2020 B10, chapter II notification 9)

The latest software version of the CMM measuring system for the component Hg manufactured by Gasmet Technology Oy is:

1.2050

In addition to the previously used power supply unit, the PSF-125-12 power supply unit from Powerbox Oy can also be used in the future.
For measuring the pressure of the instrument air, the digital pressure transmitter from the manufacturer Festo, type SPTE-P10R-S6-V-2.5K, can also be used instead of the analogue manometer used up to now.

Statement issued by TÜV Rheinland Energy GmbH dated 09 September 2020

Publication in the German Federal Gazette: BAnz AT 05.08.2021 B5, Chap. IV
notification 35, Announcement by UBA dated 29 June 2021:

35 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter I number 2.1) and of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter III notification 32)

Labelling on the Hg analyser and the test gas generator of the CMM measuring system for the component Hg manufactured by Gasmet Technology Oy has been adapted to the current corporate design. The colour scheme is now blue instead of yellow.

Statement issued by TÜV Rheinland Energy GmbH dated 03 May 2021

Publication in the German Federal Gazette: BAnz AT 11.04.2022 B10, Chap. VI notification 39, Announcement by UBA dated 09 March 2022:

39 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter I number 2.1) and of 29 June 2021 (BAnz AT 05.08.2021 B5, chapter IV notification 35)

The current software version of the measuring device CMM for the component Hg of the manufacturer Gasmet Technology Oy is:
1.2060

The measuring device can now also be equipped with the Beckhoff CP6607-0001-0020 panel PC.

Statement issued by TÜV Rheinland Energy GmbH dated 14 September 2021

Publication in the German Federal Gazette: BAnz AT 28.07.2022 B4, Chap. III notification 13, Announcement by UBA dated 28 June 2022:

13 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter I number 2.1) and of 9 March 2022 (BAnz AT 11.04.2022 B10, chapter VI notification 39)

The current software version of the measuring device CMM for the component Hg of the manufacturer Gasmet Technology Oy is:
1.2070

Statement issued by TÜV Rheinland Energy GmbH dated 18 May 2022

Publication in the German Federal Gazette: BAnz AT 20.03.2023 B6, Chap. IV notification 28, Announcement by UBA dated 21 February 2023:

28 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter I number 2.1) and of 28 June 2022 (BAnz AT 28.07.2022 B4, chapter III notification 13)

The sampling probe of the CMM measuring system for the component Hg from the manufacturer Gasmet Technology Oy can now also be equipped with two additional heat transfer elements made of aluminum.

Statement issued by TÜV Rheinland Energy GmbH dated 15 September 2022

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

The CMM measuring system is a continuous extractive mercury analyser. A sample flow is extracted from the waste gas using an electronically heated probe tube and diluted with nitrogen in the probe. The diluted sample gas then flows to the analyser cabinet via a heated sample gas line, where it first passes through a thermal catalytic converter which converts chemically bound mercury present in the waste gas into atomic mercury. The mercury present in the waste gas is then measured with the help of a spectrometer using atomic fluorescence spec-troscopy (CVAF; cold vapour atomic fluorescence).

The AMS under test comprises the following main components:

- Sampling probe (stainless steel, glass coated) heated to 180 °C c/w dilution unit and back purging unit
- Cable bundle connecting probe and analyser cabinet containing 4 separate gas lines (diluted sample gas from the probe to the analyser cabinet (heated), adjustment gas (heated), compressed air for back purging and nitrogen for diluting from analyser cabinet to probe), Lines of 8 to 25 m length were used during the performance test.
- Air-conditioned analyser cabinet (dimensions 2.03/0.6/0.6 m c/w air conditioning) comprising the following components:
  - Mercury analyser c/w high-temperature converter
  - Adjustment gas generator, which produces Hg(0) and HgCl2 adjustment gas (outside the scope of testing),
  - Nitrogen generator for dilution,
  - Windows PC c/w Gasmet MAUI software (Mercury Analyzer User Interface) for control and evaluation purposes (Mercury Analyzer User Interface) Software,
  - Sample gas pump,
  - Compressed air preparation,
  - Interface chips for analogue and digital inputs and outputs.

The adjustment gas generator produces Hg(0) and HgCl separately. The adjustment gas produced reaches the probe through a heated line. During performance testing, the zero point and span point were checked daily and automatically using Hg(0).

The $HgCl_2$ feature of the adjustment gas generator was deactivated during the test and is thus not performance-tested.

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: **qal1.de**.

History of documents
Certification of CMM is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial certification according to EN 15267
Certificate No. 0000056506_00: 13 April 2018
Expiry date of the certificate: 25 March 2023
Test report: 936/21238865/A dated 2 October 2017
TÜV Rheinland Energy GmbH
Publication: BAnz AT 26.03.2018 B8, chapter I number 2.1
UBA announcement dated 21 February 2018

Supplementary testing according to EN 15267
Certificate No. 0000056506_01: 4 September 2018
Expiry date of the certificate: 25 March 2023
Test report: 936/21238865/C dated 8 March 2018
TÜV Rheinland Energy GmbH
Publication: BAnz AT 17.07.2018 B9, chapter I number 2.2
UBA announcement dated 3 July 2018

Supplementary testing according to EN 15267
Certificate No. 0000056506_02: 12 June 2019
Expiry date of the certificate: 25 March 2024
Test report: 936/21238865/D dated 1 October 2018
TÜV Rheinland Energy GmbH
Publication: BAnz AT 26.03.2019 B7, chapter I number 1.1
UBA announcement dated 27 February 2019

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 7 March 2019
Publication: BAnz AT 22.07.2019 B8, chapter V notification 8
UBA announcement dated 28 June 2019
(New address)

Statement issued by TÜV Rheinland Energy GmbH dated 10 September 2019
Publication: BAnz AT 24.03.2020 B7, chapter IV notification 49
UBA announcement dated 24 February 2020
(Hard and software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 12 March 2020
Publication: BAnz AT 31.07.2020 B10, chapter II notification 9
UBA announcement dated 27 May 2020
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 9 September 2020
Publication: BAnz AT 03.05.2021 B9, chapter III notification 32
UBA announcement dated 31 March 2021
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 3 May 2021
Publication: BAnz AT 05.08.2021 B5, chapter IV notification 35
UBA announcement dated 29 June 2021
(Hardware changeSoftwareänderung)

Statement issued by TÜV Rheinland Energy GmbH dated 14 September 2021
Publication: BAnz AT 11.04.2022 B10, chapter VI notification 39
UBA announcement dated 9 March 2022
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 18 May 2022
Publication: BAnz AT 28.07.2022 B4, chapter III notification 13
UBA announcement dated 28 June 2022
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 15 September 2022
Publication: BAnz AT 20.03.2023 B6, chapter IV notification 28
UBA announcement dated 21 February 2023
(Hardware changes)

Renewal of certificate

Certificate No. 0000056506_03:	20 March 2024
Expiry date of the certificate:	25 March 2029

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system			
Manufacturer		Gasmet Technologies Oy	
AMS designation		CMM	
Serial number of units under test		17010 / 17011	
Measuring principle		Atomic fluorescence	
Test report		936/21238865/C	
Test laboratory		TÜV Rheinland	
Date of report		2018-03-08	
Measured component		Hg	
Certification range		0 - 5	µg/m³
Evaluation of the cross-sensitivity (CS)			
(system with largest CS)			
Sum of positive CS at zero point		0.00	µg/m³
Sum of negative CS at zero point		0.01	µg/m³
Sum of postive CS at span point		0.16	µg/m³
Sum of negative CS at span point		0.00	µg/m³
Maximum sum of cross-sensitivities		0.16	µg/m³
Uncertainty of cross-sensitivity	u_i	0.091	µg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.057	µg/m³	0.003	(µg/m³)²
Lack of fit	u_{lof}	-0.030	µg/m³	0.001	(µg/m³)²
Zero drift from field test	$u_{d,z}$	0.049	µg/m³	0.002	(µg/m³)²
Span drift from field test	$u_{d,s}$	-0.081	µg/m³	0.007	(µg/m³)²
Influence of ambient temperature at span	u_t	0.038	µg/m³	0.001	(µg/m³)²
Influence of supply voltage	u_v	0.023	µg/m³	0.001	(µg/m³)²
Cross-sensitivity (interference)	u_i	0.091	µg/m³	0.008	(µg/m³)²
Influence of sample gas flow	u_p	-0.020	µg/m³	0.000	(µg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.040	µg/m³	0.002	(µg/m³)²

* The larger value is used :
"Repeatability standard deviation at set point" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.16	µg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.31	µg/m³

Relative total expanded uncertainty	**U in % of the ELV 2 µg/m³**	**15.6**
Requirement of 2010/75/EU	**U in % of the ELV 2 µg/m³**	**40.0**
Requirement of EN 15267-3	U in % of the ELV 2 µg/m³	30.0