Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000072200_01

Certified AMS:	CMM AutoQAL for Mercury
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 (2023), EN 15267-3 (2007) as well as EN 14181 (2014).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 10 pages).
The present certificate replaces certificate 0000072200_00 dated 4 June 2020.

TÜVRheinland® CERTIFIED
Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance
www.tuv.com
ID 0000072200

Publication in the German Federal Gazette (BAnz) of 24 March 2020

German Environment Agency

Dessau, 20 March 2025

This certificate will expire on:
23 March 2030

TÜV Rheinland Energy & Environment GmbH
Cologne, 18 March 2025

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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:	936/21247480/A dated 8 August 2019
Initial certification:	24 March 2020
Expiry date:	23 March 2030
Certificate:	Renewal (of previous certificate 0000072200_00 of 4 June 2020 valid until 23 March 2025)
Publication:	BAnz AT 24.03.2020 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), TA Luft:2002, 30th BImSchV:2019 and 27th BImSchV:2013. 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 and a six-months field test, an additional three-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 936/21247480/A dated 8 August 2019 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 24.03.2020 B7, chapter I No. 1.1, Announcement by UBA dated 24 February 2020:

AMS designation:
CMM AutoQAL for Hg

Manufacturer:
Gasmet Technologies Oy, Vantaa, 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 – 1000	µg/m³

Software version:
1.2031

Restrictions:
None

Notes:
1. The maintenance interval is four weeks.
2. Wet test gases should be used for testing Hg.
3. The internal $HgCl_2$ test gas generator or an external test gas generator may be used for regular zero and span checks.
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.

Test Report:
TÜV Rheinland Energy GmbH, Cologne
Report No.: 936/21247480/A dated 8 August 2019

Publication in the German Federal Gazette: BAnz AT 31.07.2020 B10, Chap. II notification 10, Announcement by UBA dated 27 May 2020:

10 Notification as regards Federal Environment Agency (UBA) notice of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter I number 1.1)

The latest software version of the CMM AutoQAL 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 33, Announcement by UBA dated 31 March 2021:

33 Notification as regards Federal Environment Agency (UBA) notices of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter I number 1.1) and of 27 May 2020 (BAnz AT 31.07.2020 B10, chapter II notification 10)

The latest software version of the CMM AutoQAL 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 36, Announcement by UBA dated 29 June 2021:

36 Notification as regards Federal Environment Agency (UBA) notices of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter I number 1.1) and of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter III notification 33)

Labelling on the Hg analyser and the test gas generator of the CMM AutoQAL 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 40, Announcement by UBA dated 9 March 2022:

40 Notification as regards Federal Environment Agency (UBA) notices of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter I number 1.1) and of 29 June 2021 (BAnz AT 05.08.2021 B5, chapter IV notification 36)

The current software version of the measuring device CMM AutoQAL 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 14, Announcement by UBA dated 28 June 2022:

14 Notification as regards Federal Environment Agency (UBA) notices of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter I number 1.1) and of 9 March 2022 (BAnz AT 11.04.2022 B10, chapter VI notification 40)

The current software version of the measuring device CMM AutoQAL 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 29, Announcement by UBA dated 21 February 2023:

29 Notification as regards Federal Environment Agency (UBA) notices of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter I number 1.1) and of 28 June 2022 (BAnz AT 28.07.2022 B4, chapter III notification 14)

The sampling probe of the CMM AutoQAL 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

Publication in the German Federal Gazette: BAnz AT 10.05.2024 B7, Chap. V notification 24, Announcement by UBA dated 19 March 2024:

24 Notification as regards Federal Environment Agency (UBA) notices of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter I number 1.1) and of 21 February 2023 (BAnz AT 20.03.2023 B6, chapter IV notification 29)

The current software version for the CMM AutoQAL measuring system for the Hg component from the manufacturer Gasmet Technology Oy is:
1.2080.

Furthermore, the alternative vaporiser nozzle type ARG-1-US6 can be used in the integrated test gas generator.

Statement issued by TÜV Rheinland Energy GmbH dated 15 December 2023

Publication in the German Federal Gazette: BAnz AT 31.10.2024 B9, Chap. IV notification 23, Announcement by UBA dated 31. August 2024

23 Notification as regards Federal Environment Agency (UBA) notices of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter I number 1.1) and of 19 March 2024 (BAnz AT 10.05.2024 B7, chapter V notification 24).

The current software version for the CMM AutoQAL measuring system for the Hg component from the manufacturer Gasmet Technology Oy is:
1.2090.

The measuring device can be connected to the alternative 24 VDC power supply from the Type XP POWER FCB100US24 be equipped.

Furthermore, the alternative mass flow controllers with the model numbers 8741 and 8742 can be used in the integrated tracer gas generator.

Statement issued by TÜV Rheinland Energy & Environment GmbH
dated 10 May 2024

Certified product

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

The CMM AutoQAL 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 spectroscopy (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 $HgCl_2$ adjustment gas
    - Nitrogen generator for dilution,
    - Windows PC c/w Gasmet MAUI software 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 $HgCl_2$ adjustment gas 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 internal $HgCl_2$ test gas generator or an external test gas generator may be used for regular zero and span checks during maintenance interval.

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 AutoQAL 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. 0000072200_00: 4 June 2020
Expiry date of the certificate: 23 March 2025
Test report: 936/21247480/A dated 8 August 2019
TÜV Rheinland Energy GmbH
Publication: BAnz AT 24.03.2020 B7, chapter I number 1.1
UBA announcement dated 24 February 2020

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 12 March 2020
Publication: BAnz AT 31.07.2020 B10, chapter II notification 10
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 33
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 36
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 40
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 14
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 29
UBA announcement dated 21 February 2023
(Hardware changes)

Statement issued by TÜV Rheinland Energy & Environment GmbH dated 15 December 2023
Publication: BAnz AT 10.05.2024 B7, chapter V notification 24
UBA announcement dated 19 March 2024
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energy & Environment GmbH dated 10 May 2024
Publication: BAnz AT 31.10.2024 B9, chapter IV notification 23
UBA announcement dated 31 August 2024
(Soft- and hardware changes)

Renewal of certificates
Certificate No. 0000072200_01: 20 March 2025
Expiry date of the certificate: 23 March 2030

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

Measuring system			
Manufacturer		Gasmet Technologies Oy	
AMS designation		CMM AutoQAL*	
Serial number of units under test		17010 / 17011	
Measuring principle		Atomic fluorescence	
Test report		936/21247480/A	
Test laboratory		TÜV Rheinland	
Date of report		2019-08-08	
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	$u_{d,s}$	-0.072	µg/m³	0.005	(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)	$u_c = \sqrt{\sum (u_{max\ j})^2}$	0.15	µg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.30	µg/m³

Relative total expanded uncertainty	**U in % of the ELV 2 µg/m³**	**15.2**
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

*) The results of the Gasmet CMM suitability test were used here.