Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000072200

AMS designation:	CMM AutoQAL for Mercury
Manufacturer:	Gasmet Technologies Oy Mestarintie 6 01730 Vantaa Finland
Test Laboratory:	TÜV Rheinland Energy 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 6 pages).

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

This certificate will expire on: 23 March 2025

German Federal Environment Agency
Dessau, 04 June 2020

Dr. Marcel Langner
Head of Section II 4.1

TÜV Rheinland Energy GmbH
Cologne, 03 June 2020

ppa. Dr Peter Wilbring

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Test institute accredited to EN ISO/IEC 17025:2005 by DAkkS (German Accreditation Body).
This accreditation is limited to the accreditation scope defined in the enclosure to certificate D-PL-11120-02-00.

10/221 2.06

Test Report:	936/21247480/A dated 8 August 2019
Initial certification:	24 March 2020
Expiry date:	23 March 2025
Publication:	BAnz AT 24.03.2020 B7, chapter I number 1.1

Approved application
The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13th BImSchV), chapter IV (17th BImSchV), 30th BImSchV, plants in compliance with TA Luft and plants according to the 27th BImSchV. 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, 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 limit values relevant to the application.

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

Basis of the certification
This certification is based on:

- Test report no. 936/21247480/A dated 8 August 2019 issued by 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 number 1.1, UBA announcement 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 performance testing:

Component	Certification range	supplementary measuring 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

Certified product

This certification 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 remarks

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 manufacturing process for 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 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 document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at **qal1.de**.

Document history

Certification of the CMM AutoQAL measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

Initial certification according to EN 15267

Certificate no. 0000072200: 04 June 2020
Expiry date of the certificate: 23 March 2025
Test report 936/21247480/A dated 8 August 2019
TÜV Rheinland Energy GmbH, Cologne
Publication: BAnz AT 24.03.2020 B7, chapter I number 1.1
UBA announcement dated 24 February 2020

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_n	-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.