CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000069251_01

Certified AMS:	VOC72e for Benzene
Manufacturer:	ENVEA 111, Boulevard Robespierre 78304 Poissy Cedex France
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 4202-1 (2018), EN 14662-3 (2016), Guide for Demonstration of Equivalence of Ambient Air Monitoring Methods (2010) as well as EN 15267-1 (2009) and EN 15267-2 (2023).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 11 pages).
The present certificate replaces certificate 0000069251_00 dated 17 June 2020.

TÜVRheinland® CERTIFIED

Suitability Tested
Complying with 2008/50/EC
EN 15267
Regular Surveillance

www.tuv.com
ID 0000069251

Publication in the German Federal Gazette (BAnz) of 7 May 2020

German Environment Agency

Dessau, 5 May 2025

This certificate will expire on:
6 May 2030

TÜV Rheinland Energy & Environment GmbH
Cologne, 4 May 2025

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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:	936/21244174/A dated 13 June 2019
Initial certification:	7 May 2020
Expiry date:	6 May 2030
Certificate:	Renewal (of previous certificate 0000069251_00 of 17 June 2020 valid until 6 May 2025)
Publication:	BAnz AT 07.05.2020 B8, chapter II No. 1.1

Approved application

The tested AMS is suitable for continuous immission measurement of Benzene in stationary use.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three month field test.

The AMS is approved for an ambient temperature range of 0 °C to 30 °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 936/21244174/A dated 13 June 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 07.05.2020 B8, chapter II No. 1.1, Announcement by UBA dated 31 March 2020:

AMS designation:
VOC72e for benzene

Manufacturer:
ENVEA, Poissy, France

Field of application:
For continuous ambient air monitoring of benzene (stationary operation)

Measuring ranges during the performance test:

Component	Certification range	Unit
Benzene	0–50	µg/m³

Software version:
1.0.a

Restrictions:
None

Notes:
1. Given its measuring principle, the instrument does not provide a life zero.
2. The test report on performance testing is available on the internet at www.qal1.de.

Test institute: TÜV Rheinland Energy GmbH, Cologne
Report No.: 936/21244174/A dated 13 June 2019

Publication in the German Federal Gazette: BAnz AT 03.05.2021 B9, Chap. III notification 23, Announcement by UBA dated 31 March 2021:

23 Notification as regards Federal Environment Agency (UBA) notice of 31 March 2020 (BAnz AT 07.05.2020 B8, chapter II number 1.1)

The latest software version of the VOC72e measuring system for benzene manufactured by ENVEA is:
v1.0.b.

Statement issued by TÜV Rheinland Energy GmbH dated 09 September 2020

Publication in the German Federal Gazette: BAnz AT 20.03.2023 B6, Chap. IV notification 69, Announcement by UBA dated 21 February 2023:

69 Notification as regards Federal Environment Agency (UBA) notices of 31 March 2020 (BAnz AT 07.05.2020 B8, chapter II number 1.1) and of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter III notification 23)

The current software version of the VOC72e measuring system for benzene from the company ENVEA is:
v1.0.d

Statement issued by TÜV Rheinland Energy GmbH dated 09 September 2022

Publication in the German Federal Gazette: BAnz AT 10.05.2024 B7, Chap. V notification 50, Announcement by UBA dated 19 March 2024:

50 Notification as regards Federal Environment Agency (UBA) notices of 31 March 2020 (BAnz AT 07.05.2020 B8, chapter II number 1.1) and of 21 February 2023 (BAnz AT 20.03.2023 B6, chapter IV notification 69)

The current software version for the VOC72e measuring system for benzene from ENVEA is
v1.0.e

Statement issued by TÜV Rheinland Energy GmbH dated 25 September 2023

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

The VOC72e measuring system analyses volatile organic compounds. The AMS measuring principle is based on gas chromatography for the separation of the measured compounds coupled with photoionisation detection.

The VOC72e ambient air quality measuring system consists of a compact housing. The measuring system is operated via a display at the front of the instrument. The user is able to check measurement data and instrument information, change parameters and check correct functionality of the AMS.

Measuring scale	Max 1000 µg/m³ (programmable)
Units	ppb or µg/m³ (programmable)
Measured compounds	Benzene (tested), plus toluene, ethene ben-zene, m+p-xylene, o-xylene (not performance tested)
Analysis cycle time	15 min during performance testing, further in-tervals are programmable
Sample flow rate	50 ml/minute
Trap flow; trap volume	12 ml/minute; (165 ml in a 15-minute cycle)
Flow control	Internal vacuum pump + heated micro capillary
Sampling rate	>90 % of cycle duration
Adsorbent/trap temperature	Carbopack® / 35 °C
Desorption temperature/heating speed	380 °C / >160 °C / second
Injection valve	6-port (heated), pneumatically controlled
Chromatography column	Stainless steel 15 m x 0.25 mm x 1 µm apolar
Carrier gas control	Electronic pressure control
Temperature control	20 - 170 °C ± 0.1 °C, 5 ramps up to 30 °C/minute
Cooling	Liquid heat exchanger and thermo-electric cooler
Detector	Photo ionisation (PID) 10.6 eV with nitrogen curtain
Temperature control	140 °C (programmable)
Analogue outputs	4 analogue outputs 0- 1 V, 0 – 10 V, 0 – 20 mA, 4 – 20 mA, 4 analogue outputs 0 – 2.5 V
Ethernet port	RJ45 socket, UDP protocol
Digital outputs	USB, RS232 and RS422
Input voltage	100 – 240 V + ground; 50 – 60 Hz
Power	Average 130 VA, peak 200 VA
Gas supply	Hydrogen 5.5; 3.2 ± 0.2 bar; 15 ml/minute
Dimensions (l x w x h)/weight	606 mm x 483 mm x 133 mm / 12.5 kg

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 VOC72e 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. 0000069251_00: 17 June 2020
Expiry date of the certificate: 6 May 2025
Test report: 936/21244174/A dated 13 June 2019
TÜV Rheinland Energy GmbH
Publication: BAnz AT 07.05.2020 B8, chapter II number 1.1
UBA announcement dated 31 March 2020

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 9 September 2020
Publication: BAnz AT 03.05.2021 B9, chapter III notification 23
UBA announcement dated 31 March 2021
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 9 September 2022
Publication: BAnz AT 20.03.2023 B6, chapter IV notification 69
UBA announcement dated 21 February 2023
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 25 September 2023
Publication: BAnz AT 10.05.2024 B7, chapter V notification 50
UBA announcement dated 19 March 2024
(Software changes)

Renewal of certificates
Certificate No. 0000069251_01: 5 May 2025
Expiry date of the certificate: 6 May 2030

Expanded uncertainty laboratory, system 1

Measuring device: VOC72e
Serial-No.: 323
Measured component: Benzene
annual limit value: 5.0 µg/m³

No.	Performance characteristic		Performance criterion	Result	Partial uncertainty		Square of partial uncertainty	
2	Repeatability standard deviation anual limit vale	≤	0.25 µg/m³	0.012	$u_{r,c}$	0.00	0.0000	
3	"lack of fit" at annual limit value	≤	5.0% of gas level	2.205	u_{lj}	0.06	0.0041	
4	Sensitivity coefficient of sample gas pressure at annual limit value	≤	0.40 (µg/m³)/kPa	0.035	u_{gp}	0.08	0.0068	
5	Sensitivity coefficient of surrounding temperature at annual limit value	≤	0.08 (µg/m³)/K	0.053	u_{st}	0.13	0.0172	
6	Sensitivity coefficient of electrical voltage at annual limit value	≤	0.080 (µg/m³)/V	0.000	u_V	0.00	0.0000	
7a	Interferent H20 with 19 mmol/mol	≤	0.015 (µg/m³)/mmol/mol	-0.003	u_{H2O}	-0.04	0.0016	
8	Memory-Effect	≤	1.0 µg/m³	0.134	u_m	0.01	0.0001	
12	Difference sample/calibration port	≤	1%	0.000	$u_{\Delta sc}$	0.00	0.0000	
15	Uncertainty of test gas	≤	3%	3.000	u_{cg}	0.08	0.0056	
					Combined standard uncertainty	u_c	0.1880	µg/m³
					Expanded uncertainty	U	0.3761	µg/m³
					Relative expanded uncertainty	W	7.52	%
					Maximum allowed expanded uncertainty	W_{req}	25	%

Expanded uncertainty laboratory, system 2

Measuring device:	VOC72e			Serial-No.:	324		
Measured component:	Benzene			annual limit value:	5.0	µg/m³	

No.	Performance characteristic		Performance criterion	Result	Partial uncertainty		Square of partial uncertainty
2	Repeatability standard deviation annual limit vale	≤	0.25 µg/m³	0.010	$u_{r,c}$	0.00	0.0000
3	"lack of fit" at annual limit value	≤	5.0% of gas level	1.398	u_l	0.04	0.0016
4	Sensitivity coefficient of sample gas pressure at annual limit value	≤	0.40 (µg/m³)/kPa	0.035	u_{gp}	0.08	0.0068
5	Sensitivity coefficient of surrounding temperature at annual limit value	≤	0.08 (µg/m³)/K	0.029	u_{st}	0.07	0.0051
6	Sensitivity coefficient of electrical voltage at annual limit value	≤	0.080 (µg/m³)/V	0.001	u_V	0.00	0.0000
7a	Interferent H20 with 19 mmol/mol	≤	0.015 (µg/m³)/mmol/mol	-0.002	u_{H2O}	-0.03	0.0008
8	Memory-Effect	≤	1.0 µg/m³	0.128	u_m	0.01	0.0001
12	Difference sample/calibration port	≤	1%	0.000	u_{Asc}	0.00	0.0000
15	Uncertainty of test gas	≤	3%	3.000	u_{cg}	0.08	0.0056

Combined standard uncertainty	u_c	0.1417	µg/m³
Expanded uncertainty	U	0.2833	µg/m³
Relative expanded uncertainty	W	5.67	%
Maximum allowed expanded uncertainty	W_{req}	25	%

Combined uncertainty, laboratory and field, system 1

Measuring device:	VOC72e			Serial-No.:	323		
Measured component:	Benzene			annual limit value:	5.0	µg/m³	

No.	Performance characteristic	Performance criterion		Result	Partial uncertainty		Square of partial uncertainty	
2	Repeatability standard deviation annual limit vale	≤	0.25 µg/m³	0.012	$u_{r,lh}$	not respected, as $u_{r,lh} = 0 < u_{r,f}$	-	
3	"lack of fit" at annual limit value	≤	5.0% of gas level	2.205	$u_{l,lh}$	0.06	0.0041	
4	Sensitivity coefficient of sample gas pressure at annual limit value	≤	0.40 (µg/m³)/kPa	0.035	u_{gp}	0.08	0.0068	
5	Sensitivity coefficient of surrounding temperature at annual limit value	≤	0.08 (µg/m³)/K	0.053	u_{st}	0.13	0.0172	
6	Sensitivity coefficient of electrical voltage at annual limit value	≤	0.080 (µg/m³)/V	0.000	u_V	0.00	0.0000	
7a	Interferent H20 with 19 mmol/mol	≤	0.015 (µg/m³)/mmol/mol	-0.003	u_{H2O}	-0.04	0.0016	
8	Memory-Effect	≤	1.0 µg/m³	0.134	u_{av}	0.01	0.0001	
9	Repeatability standard deviation in field	≤	0.25 µg/m³ of average of 3 month	0.186	$u_{r,f}$	0.19	0.0346	
10	Long term drift at span	≤	10 % of cert. range	3.150	$u_{d,lh}$	0.09	0.0083	
12	Difference sample/calibration port	≤	1%	0.000	$u_{ss,c}$	0.00	0.0000	
15	Uncertainty of test gas	≤	3%	3.000	u_{cg}	0.08	0.0056	
					Combined standard uncertainty	u_c	0.3359	µg/m³
					Expanded uncertainty	U	0.6717	µg/m³
					Relative expanded uncertainty	W	13.43	%
					Maximum allowed expanded uncertainty	W_{req}	25	%

Combined uncertainty, laboratory and field, system 2

Measuring device: VOC72e Serial-No.: 324

Measured component: Benzene annual limit value: 5.0 µg/m³

No.	Performance characteristic		Performance criterion	Result	Partial uncertainty		Square of partial uncertainty	
2	Repeatability standard deviation annual limit vale	≤	0.25 µg/m³	0.010	$u_{r,lh}$	not respected, as $u_{r,lh} = 0 < u_{r,f}$	-	
3	"lack of fit" at annual limit value	≤	5.0% of gas level	1.398	$u_{l,lh}$	0.04	0.0016	
4	Sensitivity coefficient of sample gas pressure at annual limit value	≤	0.40 (µg/m³)/kPa	0.035	u_{gp}	0.08	0.0068	
6	Sensitivity coefficient of surrounding temperature at annual limit value	≤	0.08 (µg/m³)/K	0.029	u_{st}	0.07	0.0051	
7	Sensitivity coefficient of electrical voltage at annual limit value	≤	0.080 (µg/m³)/V	0.001	u_V	0.00	0.0000	
8a	Interferent H20 with 19 mmol/mol	≤	0.015 (µg/m³)/mmol/mol	-0.002	u_{H2O}	-0.03	0.0008	
9	Memory-Effect	≤	1.0 µg/m³	0.128	u_{av}	0.01	0.0001	
10	Repeatability standard deviation in field	≤	0.25 µg/m³ of average of 3 month	0.186	$u_{r,f}$	0.19	0.0346	
12	Long term drift at span	≤	10 % of cert. range	3.510	$u_{d,l,lh}$	0.10	0.0103	
18	Difference sample/calibration port	≤	1%	0.000	$u_{\Delta sc}$	0.00	0.0000	
21	Uncertainty of test gas	≤	3%	3.000	u_{cg}	0.08	0.0056	
					Combined standard uncertainty	u_c	0.3155	µg/m³
					Expanded uncertainty	U	0.6309	µg/m³
					Relative expanded uncertainty	W	12.62	%
					Maximum allowed expanded uncertainty	W_{req}	25	%