

CERTIFICATE

On Product Conformity (QAL1)

Number of Certificate: LUBW001430003_01

Certified AMS: Gas chromatograph GCX55-601 version FID

Manufacturer: Synspec B. V.
De Deimten 1
9747 AV Groningen
The Netherlands

Test institute: LUBW Landesanstalt für Umwelt
Baden-Württemberg

**This is to certify that the automated measuring system (AMS)
has been tested and certified according to the standards
DIN EN 14662-3: 2016, VDI 4202-1: 2018,
DIN EN 15267-1: 2009, DIN EN 15267-2: 2009.**

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 7 pages).

Publication in the German Federal Gazette
(BAnz.) from 02.08.2023

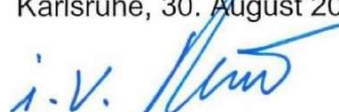
This certificate is valid until:
01. August 2028

German Federal Environment Agency
Dessau, 01. September 2023

LUBW Landesanstalt für Umwelt
Baden-Württemberg
Karlsruhe, 30. August 2023



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Großoberfeld 3
76135 Karlsruhe

Accreditation according to DIN EN ISO/IEC 17025:2018

Test report:	SYN143-E02/22D from 05. April 2023
Initial certification:	02. August 2023
Expiry date:	01. August 2028
Publication:	BAnz AT 02.08.2023 B7, chapter II, number 4.1

Approved application

The certified AMS is suitable for continuous ambient air monitoring of benzene (stationary operation).

The suitability of the AMS for this application was assessed based on a laboratory test and a three months field test at a traffic related location.

The AMS is approved for a temperature range of 0 °C to 30 °C.

The notification of suitability of the AMS, performance testing, and the uncertainty calculation have been effected based on the regulations valid at the time of performance testing. As changes in legal regulations are possible, any potential user should ensure in consultation with the manufacturer that this AMS is suitable for monitoring the limit value relevant to the application.

Any potential user should ensure in consultation with the manufacturer, that the AMS is suitable for the planned application site.

Basis of the certification

This certification is based on:

- test report SYN143-E02/22D from 05. April 2023
- suitability announced by the German Environmental Agency (UBA) as the relevant body
- the ongoing surveillance of the product and the manufacturing process

Publication in the German Federal Gazette: BAnz AT 02.08.2023 B7, chapter II, number 4.2, announcement by UBA from 05. July 2023:

AMS name:

Gas chromatograph GCX55-601 version FID

Manufacturer:

Synspec B.V., Groningen, the Netherlands

Approval:

For continuous ambient air monitoring of benzene concentration (stationary operation)

Measuring ranges during the performance test:

<i>Component</i>	<i>Certification range</i>	<i>Unit</i>
Benzene	0 - 50	µg/m ³

Software version:

6.4.2.19

Limitations:

none

Remarks:

1. The AMS is not equipped with a live zero point.
2. The performance test report can be viewed on the internet at www.qal1.de.

Test institute:

Landesanstalt für Umwelt Baden-Württemberg (LUBW)

Report no.: SYN143-E02/22D from 5. April 2023

Certified product:

This certificate is valid for automated measuring systems that conform to the following description:
The gas chromatograph GCX55-601 (version FID) is an analyzer for the automatic, quasi-continuous measurement of benzene, toluene, ethylbenzene and m/p- and o-xylene in ambient air with sample pre-concentration, thermic desorption and subsequent gas chromatographic separation.

The tested AMS is assembled in 19" housing with the following technical data:

Housing 19"

Height:	5 HE (=22.4 cm)
Depth:	55.2 cm
Width:	43.0 cm
Weight:	20 kg

Voltage and gas supply:

Voltage:	230 VAC
Power consumption:	300 VA (operation)
Carrier gas:	Nitrogen
Fuel gas:	Hydrogen
Gas ports:	Swagelok 1/8" fittings
Detector:	FID – Flame ionization detector

Sampling:

Cycle time:	15 min
Sample volume:	35 ml
Flow rate:	15 ml/min (operation)
Column type:	CP 70003; (Synspec SY-1)
Column length:	Analytical column: 26 m; Stripper column: 4 m
Absorbent agent:	Graphsphere 2016
10-port-valve:	AFP ELDV2

Communication:

Interfaces:	4 analog outputs 7 digital outputs 4 digital inputs 2x Ethernet, 4x RS232, 4 x USB 2.0, VGA
Protocols:	ASCII (Synspec own protocol), Bayern-Hessen, Gesytec, Modbus

Others:

Current software version:	6.4.2.19
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General notes:

This certificate is based upon the equipment, which was tested. The manufacturer is responsible for ensuring, that on-going production complies with the requirements of the DIN EN 15267. The manufacturer is obligated, to maintain an approved quality management system for the controlling of the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance.

If a product of the current production does not correspond with the certified product, the Landesanstalt für Umwelt Baden-Württemberg is to be informed at the given address on page 1.

This document remains property of the Landesanstalt für Umwelt Baden-Württemberg. With revocation of the publication the certificate loses its validity. After the expiration of the validity of the certificate and on requests of the Landesanstalt für Umwelt Baden-Württemberg this document shall be returned and the certificate shall no longer be used.

The relevant version of this certificate and the validity is also accessible on the internet address: www.gal1.de.

The certification of the AMS gas chromatograph GCX55-601 (version FID) is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Basic approval:

Test report no.: SYN143-E02/22D from 05. April 2023

Landesanstalt für Umwelt Baden-Württemberg; Karlsruhe

Publication: BAnz AT 02.08.2023 B7, chapter II, number 4.1

Announcement by UBA from 05. Juli 2023

Initial certification according to DIN EN 15267:

Certificate no. LUBW001430003: 02. August 2023

Expire date of the certificate: 01. August 2028

**Results of the laboratory and field tests and the measurement uncertainties according to DIN EN 14662-3
Synspec GCX55-601 (FID 1 – GC 80002)**

Parameter	Minimum requirement	Value	Given benzene-conc. C_t	Sensitivity coefficient	X_{min}	X_{max}	u	u^2
Repeatability standard deviation	$\leq 0,25 \mu\text{g}/\text{m}^3$	0,07 $\mu\text{g}/\text{m}^3$	5,3 $\mu\text{g}/\text{m}^3$				0,02 $\mu\text{g}/\text{m}^3$	0,00048 $(\mu\text{g}/\text{m}^3)^2$
Largest deviation of linearity	$\leq 5,0 \%$	-3,99 %	5,8 $\mu\text{g}/\text{m}^3$				-0,12 $\mu\text{g}/\text{m}^3$	0,013 $(\mu\text{g}/\text{m}^3)^2$
Change of the sample gas pressure	$\leq 0,1 (\mu\text{g}/\text{m}^3)/\text{kPa}$	0,04 $(\mu\text{g}/\text{m}^3)/\text{kPa}$	36,2 $\mu\text{g}/\text{m}^3$	0,04 $(\mu\text{g}/\text{m}^3)/\text{kPa}$	80 kPa	110 kPa	0,10 $\mu\text{g}/\text{m}^3$	0,011 $(\mu\text{g}/\text{m}^3)^2$
Change of the surrounding temperature	$\leq 0,08 (\mu\text{g}/\text{m}^3)/\text{K}$	0,06 $(\mu\text{g}/\text{m}^3)/\text{K}$	38,7 $\mu\text{g}/\text{m}^3$	0,06 $(\mu\text{g}/\text{m}^3)/\text{K}$	273 K	303 K	0,14 $\mu\text{g}/\text{m}^3$	0,02 $(\mu\text{g}/\text{m}^3)^2$
Change of the electrical voltage	$\leq 0,08 (\mu\text{g}/\text{m}^3)/\text{V}$	0,005 $(\mu\text{g}/\text{m}^3)/\text{V}$	36,2 $\mu\text{g}/\text{m}^3$	0,00 $(\mu\text{g}/\text{m}^3)/\text{V}$	210 V	245 V	0,013 $\mu\text{g}/\text{m}^3$	0,0002 $(\mu\text{g}/\text{m}^3)^2$
Interfering component H_2O (19 mmol/mol)	$\leq 0,015 (\mu\text{g}/\text{m}^3)/(\text{mmol}/\text{mol})$	0,005 $(\mu\text{g}/\text{m}^3)/(\text{mmol}/\text{mol})$	5,3 $\mu\text{g}/\text{m}^3$	0,0049 $(\mu\text{g}/\text{m}^3)/(\text{mmol}/\text{mol})$	0,6 Vol-%	2,1 Vol-%	0,066 $\mu\text{g}/\text{m}^3$	0,00434 $(\mu\text{g}/\text{m}^3)^2$
Carry over (memory-effect)	$\leq 1,0 \mu\text{g}/\text{m}^3$	0,30 $\mu\text{g}/\text{m}^3$	44,5 $\mu\text{g}/\text{m}^3$				0,02 $\mu\text{g}/\text{m}^3$	0,0004 $(\mu\text{g}/\text{m}^3)^2$
Reproducibility standard deviation under field conditions	$\leq 0,25 \mu\text{g}/\text{m}^3$	0,07 $\mu\text{g}/\text{m}^3$					0,07 $\mu\text{g}/\text{m}^3$	0,00 $(\mu\text{g}/\text{m}^3)^2$
Long term drift at span-value	$\leq 10,0 \%$	-4,3 %	35,1 $\mu\text{g}/\text{m}^3$				-0,12 $\mu\text{g}/\text{m}^3$	0,015 $(\mu\text{g}/\text{m}^3)^2$
Short term drift at span-value	$\leq 2,0 \mu\text{g}/\text{m}^3$	0,06 $\mu\text{g}/\text{m}^3$	36,2 $\mu\text{g}/\text{m}^3$					
Difference sample/calibration port*	$\leq 1,0 \%$	k. A. %						
Maintenance interval	14 Tage	3 Monate						
Availability	$\geq 90 \%$	100,00 %						
Test gas	k. A.	2,1 %					0,05 $\mu\text{g}/\text{m}^3$	0,003 $(\mu\text{g}/\text{m}^3)^2$

Benzene annual limit value	5,0 $\mu\text{g}/\text{m}^3$
Combined standard uncertainty laboratory	0,22 ppb
Relative expanded uncertainty laboratory	9,0 %
Comb. standard uncertainty laboratory + field	0,26 ppb
Rel. expanded uncertainty laboratory + field	10,6 %

*no separate calibration port

X_{min} Minimum value of the influence quantities

X_{max} Maximum value of the influence quantities

**Results of the laboratory and field tests and the measurement uncertainties according to DIN EN 14662-3
Synspec GCX55-601 (FID 2 – GC 80005)**

Parameter	Minimum requirement	Value	Given benzene-conc. C_1	Sensitivity coefficient	X_{min}	X_{max}	u	u^2
Repeatability standard deviation	$\leq 0,25 \mu\text{g}/\text{m}^3$	0,08 $\mu\text{g}/\text{m}^3$	5,3 $\mu\text{g}/\text{m}^3$				0,02 $\mu\text{g}/\text{m}^3$	0,00059 $(\mu\text{g}/\text{m}^3)^2$
Largest deviation of linearity	$\leq 5,0 \%$	-4,29 %	5,8 $\mu\text{g}/\text{m}^3$				-0,12 $\mu\text{g}/\text{m}^3$	0,015 $(\mu\text{g}/\text{m}^3)^2$
Change of the sample gas pressure	$\leq 0,1 (\mu\text{g}/\text{m}^3)/\text{kPa}$	0,05 $(\mu\text{g}/\text{m}^3)/\text{kPa}$	36,2 $\mu\text{g}/\text{m}^3$	0,05 $(\mu\text{g}/\text{m}^3)/\text{kPa}$	80 kPa	110 kPa	0,12 $\mu\text{g}/\text{m}^3$	0,014 $(\mu\text{g}/\text{m}^3)^2$
Change of the surrounding temperature	$\leq 0,08 (\mu\text{g}/\text{m}^3)/\text{K}$	0,02 $(\mu\text{g}/\text{m}^3)/\text{K}$	38,7 $\mu\text{g}/\text{m}^3$	0,02 $(\mu\text{g}/\text{m}^3)/\text{K}$	273 K	303 K	0,06 $\mu\text{g}/\text{m}^3$	0,00 $(\mu\text{g}/\text{m}^3)^2$
Change of the electrical voltage	$\leq 0,08 (\mu\text{g}/\text{m}^3)/\text{V}$	0,003 $(\mu\text{g}/\text{m}^3)/\text{V}$	36,2 $\mu\text{g}/\text{m}^3$	0,00 $(\mu\text{g}/\text{m}^3)/\text{V}$	210 V	245 V	0,007 $\mu\text{g}/\text{m}^3$	0,0001 $(\mu\text{g}/\text{m}^3)^2$
Interfering component H_2O (19 mmol/mol)	$\leq 0,015 (\mu\text{g}/\text{m}^3)/(\text{mmol}/\text{mol})$	0,005 $(\mu\text{g}/\text{m}^3)/(\text{mmol}/\text{mol})$	5,3 $\mu\text{g}/\text{m}^3$	0,0054 $(\mu\text{g}/\text{m}^3)/(\text{mmol}/\text{mol})$	0,6 Vol-%	2,1 Vol-%	0,072 $\mu\text{g}/\text{m}^3$	0,00517 $(\mu\text{g}/\text{m}^3)^2$
Carry over (memory-effect)	$\leq 1,0 \mu\text{g}/\text{m}^3$	0,37 $\mu\text{g}/\text{m}^3$	44,5 $\mu\text{g}/\text{m}^3$				0,02 $\mu\text{g}/\text{m}^3$	0,001 $(\mu\text{g}/\text{m}^3)^2$
Reproducibility standard deviation under field conditions	$\leq 0,25 \mu\text{g}/\text{m}^3$	0,07 $\mu\text{g}/\text{m}^3$					0,07 $\mu\text{g}/\text{m}^3$	0,00 $(\mu\text{g}/\text{m}^3)^2$
Long term drift at span-value	$\leq 10,0 \%$	-4,5 %	35,1 $\mu\text{g}/\text{m}^3$				-0,13 $\mu\text{g}/\text{m}^3$	0,017 $(\mu\text{g}/\text{m}^3)^2$
Short term drift at span-value	$\leq 2,0 \mu\text{g}/\text{m}^3$	0,01 $\mu\text{g}/\text{m}^3$	36,2 $\mu\text{g}/\text{m}^3$					
Difference sample/calibration port*	$\leq 1,0 \%$	k. A. %						
Maintenance interval	14 Tage	3 Monate						
Availability	$\geq 90 \%$	100,00 %						
Test gas	k. A.	2,1 %					0,05 $\mu\text{g}/\text{m}^3$	0,003 $(\mu\text{g}/\text{m}^3)^2$

Benzene annual limit value	5,0 $\mu\text{g}/\text{m}^3$
Combined standard uncertainty laboratory	0,20 ppb
Relative expanded uncertainty laboratory	8,2 %
Comb. standard uncertainty laboratory + field	0,25 ppb
Rel. expanded uncertainty laboratory + field	10,0 %

*no separate calibration port

X_{min} Minimum value of the influence quantities

X_{max} Maximum value of the influence quantities