Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000043104_02

Certified AMS:	D-CEM2100 for dust
Manufacturer:	CODEL International Ltd. Station Road DE45 1GE Bakewell / Derbyshire United Kingdom
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 (2023) as well as EN 14181 (2014).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 8 pages).
The present certificate replaces certificate 0000043104_01 dated 2 April 2020.

TÜVRheinland® CERTIFIED

Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance

www.tuv.com
ID 0000043104

Publication in the German Federal Gazette (BAnz) of 2 April 2015

German Environment Agency

Dessau, 28 March 2025

This certificate will expire on:
1 April 2030

TÜV Rheinland Energy & Environment GmbH
Cologne, 26 March 2025

Dr. Marcel Langner
Head of Section II 4

ppa. Dr. Peter Wilbring

www.umwelt-tuv.eu tre@umwelt-tuv.eu Tel. + 49 221 806-5200	TÜV Rheinland Energy & Environment GmbH Am Grauen Stein 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:	936/21216335/A dated 2 October 2014
Initial certification:	2 April 2015
Expiry date:	1 April 2030
Certificate:	Renewal (of previous certificate 0000043104_01 of 2 April 2020 valid until 1 April 2025)
Publication:	BAnz AT 02.04.2015 B5, 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:2013), chapter IV (waste incineration plants), Directive 2015/2193/EC (44th BImSchV:2019), TA Luft:2002 and 27th BImSchV:2013. The AMS is not suitable for the use at German waste incineration plants (17th BImSchV), due to the emission limit value of 5 mg/m³. 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-month field test at a municipal waste incinerator.

The AMS is approved for an ambient temperature range of -20 °C to +50 °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 936/21216335/A dated 2 October 2014 of TÜV Rheinland Energie und Umwelt 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 02.04.2015 B5, chapter I No. 1.1, Announcement by UBA dated 25 February 2015:

AMS designation:
D-CEM2100 for dust

Manufacturer:
Codel International Ltd., Bakewell, Great Britain

Field of application:
For plants requiring to the 13th BImSchV, the 27th BImSchV and plants to TA Luft.

Measuring ranges during the performance test:

Component	Certification range	Supplementary ranges		Unit
Dust	0 – 0.1*	0 – 0.3	0 - 1	Ext.

* during performance testing in the field, this value was equivalent to approx. 0 to 10 mg/m³ of dust at a measurement path of 5 m

Software version:
507.120A (DDU)
507.069A (Transceiver Master)
507.028A (Transceiver Slave)

Restrictions:
None

Notes:
1. The maintenance interval is three months.
2. The AMS may only be used in stack gas that is not saturated with water vapour.
3. Requirements with regard to the determination coefficient R^2 of the calibration function in accordance with EN 15267-3 were not satisfied during performance testing.
4. For every plant, it shall be verified that the measuring range required for monitoring the limit value can be adjusted.

Test Institute:
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21216335/A dated 2 October 2014

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, Chap. V notification 34, Announcement by UBA dated 22 July 2015:

34 Notification as regards Federal Environment Agency (UBA) of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter 1 number 1.1)

In order to make maintenance easier, the D-CEM2100 measuring system for dust, manufactured by Codel International Ltd., can also be equipped with the redesigned ball valves with part number 903.090A.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 25 March 2015

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, Chap. IV notification 2, Announcement by UBA dated 27 February 2019:

2 Notification as regards Federal Environment Agency notices of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter I number 1.1) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter V notification 34)

The current software versions of the D-CEM2100 measuring system for dust manufactured by Codel International Ltd. are:
507-120B (DDU)
507-069B (SPU, Master)
507-028A (SPU, Slave)

Statement issued by TÜV Rheinland Energy GmbH dated 8 October 2018

Publication in the German Federal Gazette: BAnz AT 20.03.2023 B6, Chap. IV notification 11, Announcement by UBA dated 21 February 2023:

11 Notification as regards Federal Environment Agency (UBA) notices of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter I number 1.1) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV notification 2)

The D-CEM2100 measuring system for dust from the company CODEL International Ltd. can also be equipped with the LED of the type LR H9PP-HZJZ-1-1 from the manufacturer OSRAM. Up to now, an LED of type LR W5SN-JYKY-1-Z from the same manufacturer has been used.

Statement issued by TÜV Rheinland Energy GmbH dated 12 August 2022

Certified product

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

The AMS Codel D-CEM2100 is an in-situ dust monitor operating on the principle of transmission measurement. Emitted light is weakened on the measuring path. The detected weakening of light represents the measured value, which, apart from dust loading, also depends on other properties of dust, such as particle size distribution and colour.

The AMS consists of two identically constructed transceivers that both emit and receive light. During a measurement procedure, two measuring light pulses alternately pass the measuring path in opposite directions at a high frequency. Located between each of the two transceivers and the process gas is a pneumatically operated ball valve. A diffusing mirror is situated on the ball. In shut-off position the mirror is located in the ray path and reflects the emitted light. Hereby, contaminations of the optical interfaces can be detected and compensated.

For zero and span point checks the AMS must be installed on a dust-free reference junction. Span point checks are carried out by means of optical filters.

The AMS consists of the following components:

- 2 transceivers each with pneumatic valve and purge air unit
- 1 power supply unit (PSU)
- 1 signal processor unit (SPU)
- 1 data display unit with outputs (DDU)
- different reference filter
- telescope for adjustment of the light path
- dust-free path (comparative measuring path)

The distance between the two transceivers on the dust-free measurement section must be identical to the distance between the transceivers at the duct.

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 D-CEM2100 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. 0000043104_00: 2 April 2015
Expiry date of the certificate: 1 April 2020
Test report: 936/21216335/A dated 2 October 2014
TÜV Rheinland Energie und Umwelt GmbH
Publication: BAnz AT 02.04.2015 B5, chapter I number 1.1
UBA announcement dated 25 February 2015

Notifications
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 25 March 2015
Publication: BAnz AT 26.08.2015 B4, chapter V notification 34
UBA announcement dated 22 July 2015
(Hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 8 October 2018
Publication: BAnz AT 26.03.2019 B7, chapter IV notification 2
UBA announcement dated 27 February 2019
(Software changes)

Renewal of certificates
Certificate No. 0000043104_01: 2 April 2020
Expiry date of the certificate: 1 April 2025

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 12 August 2022
Publication: BAnz AT 20.03.2023 B6, chapter IV notification 11
UBA announcement dated 21 February 2023
(Hardware changes)

Renewal of certificates
Certificate No. 0000043104_02: 28 March 2025
Expiry date of the certificate: 1 April 2030

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

Measuring system	
Manufacturer	Codel International Ltd.
AMS designation	D-CEM2100
Serial number of units under test	069; 070 / 071; 072
Measuring principle	Transmission
Test report	936/21216335/A
Test laboratory	TÜV Rheinland
Date of report	2014-10-02
Measured component	Dust
Certification range	0 - 10 mg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.142	mg/m³	0.020	(mg/m³)²
Lack of fit	u_{lof}	-0.058	mg/m³	0.003	(mg/m³)²
Zero drift from field test	$u_{d,z}$	0.100	mg/m³	0.010	(mg/m³)²
Span drift from field test	$u_{d,s}$	0.130	mg/m³	0.017	(mg/m³)²
Influence of ambient temperature at span	u_t	0.120	mg/m³	0.014	(mg/m³)²
Influence of supply voltage	u_v	0.015	mg/m³	0.000	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.081	mg/m³	0.007	(mg/m³)²
Excursion of measurement beam	u_{mb}	0.153	mg/m³	0.023	(mg/m³)²

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

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.31	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.60	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 10 mg/m³**	**6.0**
Requirement of 2010/75/EU	**U in % of the ELV 10 mg/m³**	**30.0**
Requirement of EN 15267-3	U in % of the ELV 10 mg/m³	22.5