Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000038498_02

Certified AMS:	PCME STACK 710 for dust
Manufacturer:	ENVEA UK Ltd. (PCME Ltd.) ENVEA House, Rose & Crown Road Swavesey / Cambridge CB24 4RB United Kingdom
Test Institute:	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 8 pages).
The present certificate replaces certificate 0000038498_01 dated 05 March 2018.

TÜVRheinland® CERTIFIED
Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance
www.tuv.com
ID 0000038498

Publication in the German Federal Gazette (BAnz) of 05 March 2013

This certificate will expire on:
04 March 2028

German Environment Agency
Dessau, 02 March 2023

TÜV Rheinland Energy GmbH
Cologne, 01 March 2023

Dr. Marcel Langner
Head of Section II 4.1

ppa. Dr. Peter Wilbring

www.umwelt-tuv.eu
tre@umwelt-tuv.eu
Tel. + 49 221 806-5200

TÜV Rheinland Energy 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.

10/221 2.08

Test report:	936/21220334/C dated 12 October 2012
Initial certification:	05 March 2013
Expiry date:	04 March 2028
Certificate:	Renewal (of previous certificate 0000038498_01 of 05 March 2018 valid until 04 March 2023)
Publication:	BAnz AT 05.03.2013 B10, chapter I No. 1.4

Approved application
The tested AMS is suitable for use at combustion plants according to EC Directive 2001/80/EC (13th BImSchV:2012), at waste incineration plants according to EC Directive 2000/76/EC (17th BImSchV:2009), Directive 2015/2193/EC (44th BImSchV:2021), the 27th BImSchV:1997, the 30th BImSchV:2009 and TA Luft:2002. The measured ranges have been selected so as to cater for 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 15 month field test at a w municipal waste incineration plant.

The AMS is approved for an ambient temperature range of -20° 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 936/21220334/C dated 12 October 2012 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 05.03.2013 B10, chapter I No. 1.4, Announcement by UBA dated 12 February 2013:

AMS designation
PCME STACK 710 for dust

Manufacturer:
PCME Ltd., St. Ives, United Kingdom

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
Dust	0–0.2	0–0.1	0–0.4	0–1.2	Ext.

0–0.2 Ext. ≙ 15 mg/m³ dust at a measurement path length of 5 m

Software versions:
Control software version: 01.03.01
HI software version: 01.02.01

Restrictions:
None

Notes:
1. The dust concentration is determined in wet flue gas under operational conditions.
2. The maintenance interval is six months.
3. The length of the measurement path (5 m) and the measuring range of 15 mg/m³ determined during the calibration result in a product of 75 mg/m³ x m at the field test plant.
4. During performance testing in accordance with EN 15267-3, the requirement for the determination coefficient R^2 of the calibration function was not fulfilled.

Test Report:
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report no.: 936/21220334/C dated 12 October 2012

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, chap. IV notification 45, Announcement by UBA dated 27 February 2019:

45 Notification as regards Federal Environment Agency (UBA) notice of 12 February 2013 (BAnz AT 05.03.2013 chapter I number 1.4)

In the context of continuous product development of the PCME STACK 710 measuring system for dust manufactured by PCME Ltd., the following changes have been made to the measuring system:

- The measuring system may also be equipped with the Winstar WG12864C display (from HI software version 01.03.00).
- The Opal Diffusor is no longer glued on; instead it now has a clamp.
- The optical filter is fixed inside the detector assembly using a UV-curing adhesive.
- Mechanics for the control cycle was optimised to increase operational safety.
- The 47R resistance heating is used for heating the measuring system at very low temperatures.

The current software version of the measuring system is:
Control software version: 01.04.00
Software version: 01.03.02

In addition, the following software versions have been approved for this instrument version:
Control software version: 01.03.02, HI software version: 01.02.02
Control software version: 01.03.02, HI: 01.03.00;
Control software version: 01.03.04, HI software version: 01.03.01;
Control software version: 01.03.05, HI software version: 01.03.02.

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2018

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, chap. IV notification 44, Announcement by UBA dated 24 February 2020:

44 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 1.4) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV notification 45)

The company name has changed from PCME Ltd. to ENVEA UK Ltd.
The new production site for the PCME QAL 710 dust monitor manufactured by ENVEA UK Ltd. is:

ENVEA UK Ltd.
ENVEA House,
Rose & Crown Road
Swavesey
Cambridge CB24 4RB
United Kingdom

Statement issued by TÜV Rheinland Energy GmbH dated 4 December 2019

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

The PCME STACK 710 is designed to determine dust concentrations at emitting plants. It is based on the principle of optical transmission.
The PCME STACK 710 manufactured by PCME Ltd. is an advancement of the 4500 MKII+ measuring system. Three green LEDs in a specific configuration (patent filed) serve as the main light source to achieve the highest degree of homogeneity over the entire emitted light beam. The light beam is modulated at a frequency of 1 kHz to minimise electrical interference and avoid errors caused by ambient light. A second light source, the patented “Flood LED” serves to reduce the effect of temperature drift on the detectors to negligible levels.
Electronic modulation dispenses with a mechanical chopper which leaves the engines of the calibration system as the only moving parts. These engines have an extremely low duty cycle and operated very reliably.
The PCME STACK 710 continuous opacity monitoring system (COMS) manufactured by PCME Ltd. measures opacity with the help of a light beam passing through flue gases. An internal microprocessor calculates dust density and other parameters. The system comprises the following components: The transceiver containing all optical and electro-optical components, the retro reflector with a glass reflector and an air purging system.
The air purging system is available in several specifications to adapt it to local conditions. There are electrical blowers in single or double version as well as instruments operated with compressed air. In order to prevent dust and corrosive gases from affecting optical systems, a continuous supply of purge air is required. In the event of a failure in the purge air system, automatic quick action flaps may be used for temporary protection.

The measuring system essentially comprises the following components:

Transceiver:	contains all relevant electronic and electro-optical components.
Retro reflector*:*	contains a corner reflector.
Air purging:	In order to prevent dust and corrosive gases from affecting optical systems, a continuous supply of purge air is required. Single or double fans or instruments operated with compressed air are available depending on the specific requirements. In the event of a failure in the purge air system, automatic quick action flaps may be used for temporary protection.

Measurement path length and concentration:
0–0.2 Ext. ≙ 15 mg/m³ dust at a measurement path length of 5 m

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 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 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 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 PCME STACK 710 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. 0000038498_00: 22 March 2013
Expiry date of the certificate: 04 March 2018
Test report: 936/21220334/C dated 12 October 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication BAnz AT 05.03.2013 B10, chapter I number 1.4
UBA announcement dated 12 February 2013

Renewal of certificate
Certificate No. 0000038498_01: 05 March 2018
Expiry date of the certificate: 04 March 2023

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2018
Publication BAnz AT 26.03.2019 B7, chapter IV notification 45
UBA announcement dated 27 February 2019
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 4 December 2019
Publication BAnz AT 24.03.2020 B7, chapter IV notification 44
UBA announcement dated 24 February 2020
(Change of manufacturer)

Renewal of certificate
Certificate No. 0000038498_02: 02 March 2023
Expiry date of the certificate: 04 March 2028

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

Measuring system	
Manufacturer	PCME Ltd.
Name of measuring system	PCME STACK 710
Serial number of the candidates	150854 83 / 154891 91
Measuring principle	Transmission
Test report	936/21220334/C
Test laboratory	TÜV Rheinland Energie und Umwelt GmbH
Date of report	2012-10-12
Measured component	dust
Certification range	0 - 15 mg/m³

Calculation of the combined standard uncertainty

Tested parameter		u		u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.110	mg/m³	0.012	(mg/m³)²
Lack of fit	u_{lof}	-0.081	mg/m³	0.007	(mg/m³)²
Zero drift from field test	$u_{d,z}$	0.095	mg/m³	0.009	(mg/m³)²
Span drift from field test	$u_{d,s}$	-0.219	mg/m³	0.048	(mg/m³)²
Influence of ambient temperature at span	u_t	0.030	mg/m³	0.001	(mg/m³)²
Influence of supply voltage	u_v	0.023	mg/m³	0.001	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.121	mg/m³	0.015	(mg/m³)²
Excursion of measurement beam	u_{mb}	0.173	mg/m³	0.030	(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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.35	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.68	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 10 mg/m³**	**6.8**
Requirement of 2000/76/EC and 2001/80/EC	**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

Performance testing and uncertainty calculations were carried out as part of the original test of the 4500 MKIII measuring system manufactured by Land Instruments International Ltd which is identical in design.