

## PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

### **ProCeas LaserCEM**

Manufactured by:

#### **AP2E**

Les Méridiens, Bâtiment A  
240 Rue Louis de Broglie, CS90537  
13593 Aix-en-Provence Cedex 03  
France

has been assessed by CSA Group  
and for the conditions stated on this certificate complies with:

#### **Environment Agency Guidance “MCERTS for stack emissions monitoring equipment at industrial installations”**

- **Continuous emissions monitoring systems (CEMS)**

- **Published 20 October 2020**

**EN 15267-1:2009, EN15267-2:2009, EN 15267-3:2007**

& QAL 1 as defined in EN 14181: 2014

	Certification range:	Supplementary ranges:	
CO	0 to 75 mg/m <sup>3</sup>	0 to 1,249 mg/m <sup>3</sup>	
CO (L#)	0 to 30 mg/m <sup>3</sup>	0 to 250 mg/m <sup>3</sup>	
NO	0 to 78 mg/m <sup>3</sup>	0 to 150 mg/m <sup>3</sup>	0 to 2,008 mg/m <sup>3</sup>
NH <sub>3</sub>	0 to 15 mg/m <sup>3</sup>	0 to 45 mg/m <sup>3</sup>	0 to 76 mg/m <sup>3</sup>
H <sub>2</sub> O	0 to 30 vol. %	0 to 40 vol. %	
O <sub>2</sub>	0 to 21 vol. %		
SO <sub>2</sub>	0 to 75 mg/m <sup>3</sup>	0 to 2,858 mg/m <sup>3</sup>	
HCl	0 to 15 mg/m <sup>3</sup>	0 to 98 mg/m <sup>3</sup>	
HF	0 to 1.5 mg/m <sup>3</sup>	0 to 10 mg/m <sup>3</sup>	
NO <sub>2</sub>	0 to 40 mg/m <sup>3</sup>	0 to 100mg/m <sup>3</sup>	
CH <sub>4</sub>	0 to 5 mg/m <sup>3</sup>	0 to 20 mg/m <sup>3</sup>	

# denotes lower certification range

Project No.: 80191905  
Certificate No: CSA MC190347/03  
Initial Certification: 11 January 2019  
This Certificate issued: 09 August 2024  
Renewal Date: 10 January 2029



Andrew Young  
Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

### **CSA Group Testing UK Ltd**

Unit 6, Hawarden Industrial Park  
Hawarden, Deeside, CH5 3US  
Tel: +44 (0)1244 670 900



0011

*The MCERTS certificate consists of this document in its entirety.*

*For conditions of use, please consider all the information within.*

*This certificate may only be reproduced in its entirety and without change*

*To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

## Certificate Contents

Approved Site Application.....	2
Basis of Certification .....	2
Product Certified.....	3
Certified Performance .....	4
Description.....	15
General Notes .....	15

## Approved Site Application

Any potential user should ensure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency’s monitoring technical guidance notes available at [www.mcerts.net](http://www.mcerts.net)

This instrument is suitable for use on waste incineration and large combustion plants. This CEMS has been proven suitable for its measuring task (parameter and composition of the flue gas) by use of the QAL 1 procedure specified in EN14181. The lowest certified range for each determinand shall not be more than 1.5 times the daily average emission limit value (ELV) for incineration plants, and not more than 2.5 times the ELV for other types of applications.

The field trial took place at an industrial waste incinerator and a municipal waste incinerator for 5 months and 6 months respectively.

For the measurement of NO, the HCl concentration present in the waste gas must not exceed 50mg/m<sup>3</sup>.

## Basis of Certification

This certification is based on the following test report(s) and on CSA Group’s assessment and ongoing surveillance of the product and the manufacturing process:

- TÜV Rheinland Energy GmbH, Report No. 936/21228566/B, Cologne, 23 February 2018
- TÜV Rheinland Energy GmbH, Report No. 936/21228566/DE, Cologne, 20 May 2019
- TÜV Rheinland Energy GmbH, Report No. 936/21250153/A, Cologne, 06 February 2023

Certificate No: CSA MC190347/03  
This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

## Product Certified

The ProCeas LaserCEM measuring system consists of the following parts:

- 1. Sample Probe –** Model: CEM Probe “TOULON” In-situ Gas low pressure sampling probe with 2µm filter in front for Low Pressure Sampling
- 2. Heated Filter –** Model: Integrated within the probe A “Sampling Box” does the interface between the probe and the line.
- 3. Heated Sample Line -** Model: Self-Heated sample line (Temp 80°C), inside diameter 4.35mm, length 30m (used in certification)
- 4. Gas Conditioning -** None (low pressure sampling = wet sample analysis) The line is directly connected in the cabinet.
- 5. Analyser -** Model: ProCeas LaserCEM

The ‘ProCeas LaserCEM’ is a modular measuring device with each determinand having a separate module. The 38-rack unit (38U) covers all parameters stated on this certificate. The 24-rack unit (24U) covers the following parameters: CO, NO, NH<sub>3</sub>, H<sub>2</sub>O, O<sub>2</sub>, SO<sub>2</sub> and HCl.

The instrument name has been changed from LaserCEM to ProCeas LaserCEM. The LaserCEM covers the parameters: CO, NO, NH<sub>3</sub>, H<sub>2</sub>O, O<sub>2</sub>, SO<sub>2</sub> and HCl and the ‘ProCeas LaserCEM’ covers the following additional parameters: CO (L), HF, NO<sub>2</sub> and CH<sub>4</sub>.

Allowable variations may include:

- A different brand or model of sampling system of the same type, if there is evidence the alternative system works with similar types of CEMS that use low pressure sampling.
- Longer or shorter transfer line (in accordance with allowable response time).

This certificate applies to all instruments fitted with software version 3.0.8.24 (serial number SN2015-0120) onwards

Certificate No: CSA MC190347/03  
This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

### Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C  
 Instrument IP rating: IP55

Note: For outdoor installations the analyser needs to be mounted into an IP65 environment. If the instrument is supplied with an enclosure, then the ambient temperature shall be monitored inside the enclosure to ensure that it stays within the above ambient temperature range.

Results are expressed as error % of certification range, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						Clause 10.9
CO (0-75 mg/m <sup>3</sup> )					85s	≤200s
CO (0-1249 mg/m <sup>3</sup> )					174s	≤200s
CO (L) (0-30 mg/m <sup>3</sup> )					57s	≤200s
CO (L) (0-250 mg/m <sup>3</sup> )					54s	≤200s
NO (0-78 mg/m <sup>3</sup> )					56s	≤200s
NO (0-150 mg/m <sup>3</sup> )					22s	≤200s
NO (0-2008 mg/m <sup>3</sup> )					44s	≤200s
NH <sub>3</sub> (0-15 mg/m <sup>3</sup> )					90s	≤400s
NH <sub>3</sub> (0-76 mg/m <sup>3</sup> )					198s	≤400s
H <sub>2</sub> O (0-30 Vol.-%)					58s	≤200s
H <sub>2</sub> O (0-40 Vol.-%)					36s	≤200s
O <sub>2</sub> (0-21 Vol.-%)					35s	≤200s
SO <sub>2</sub> (0-75 mg/m <sup>3</sup> )					96s	≤200s
SO <sub>2</sub> (0-2,858 mg/m <sup>3</sup> )					64s	≤200s
HCl (0-15 mg/m <sup>3</sup> )					105s	≤400s
HCl (0-98 mg/m <sup>3</sup> )					199s	≤400s
HF (0-1.5 mg/m <sup>3</sup> )					130s	≤400s
HF (0-10 mg/m <sup>3</sup> )					73s	≤400s
NO <sub>2</sub> (0-40 mg/m <sup>3</sup> )					60s	≤200s
NO <sub>2</sub> (0-100 mg/m <sup>3</sup> )					55s	≤200s
CH <sub>4</sub> (0-5 mg/m <sup>3</sup> )					58s	≤200s
CH <sub>4</sub> (0-20 mg/m <sup>3</sup> )					58s	≤200s

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Repeatability standard deviation at zero point						Clause 10.10
CO	0.0					≤2.0%
CO (L)	0.0					≤2.0%
NO	0.0					≤2.0%
NH <sub>3</sub>	0.0					≤2.0%
H <sub>2</sub> O	0.0					≤2.0%
O <sub>2</sub>	0.0					≤0.2%
SO <sub>2</sub>	0.0					≤2.0%
HCl	0.0					≤2.0%
HF	0.0					≤2.0%
NO <sub>2</sub>	0.0					≤2.0%
CH <sub>4</sub>	0.0					≤2.0%
Repeatability standard deviation at reference point						Clause 10.11
CO	0.4					≤2.0%
CO (L)	0.0					≤2.0%
NO	0.2					≤2.0%
NH <sub>3</sub>		0.7				≤2.0%
H <sub>2</sub> O		0.7				≤2.0%
O <sub>2</sub>	0.01					≤0.2%
SO <sub>2</sub>	0.1					≤2.0%
HCl	0.1					≤2.0%
HF	0.1					≤2.0%
NO <sub>2</sub>	0.1					≤2.0%
CH <sub>4</sub>	0.0					≤2.0%

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack-of-fit						Clause 10.12
CO (0-75 mg/m <sup>3</sup> )		1.00				≤2.0%
CO (0-1249 mg/m <sup>3</sup> )	-0.48					≤2.0%
CO (L) (0-30 mg/m <sup>3</sup> )	0.47					≤2.0%
CO (L) (0-250 mg/m <sup>3</sup> )		-1.08				≤2.0%
NO (0-78 mg/m <sup>3</sup> )		-0.97				≤2.0%
NO (0-150 mg/m <sup>3</sup> )		-0.95				≤2.0%
NO (0-2008 mg/m <sup>3</sup> )		-1.00				≤2.0%
NH <sub>3</sub> (0-15 mg/m <sup>3</sup> )			1.07			≤2.0%
NH <sub>3</sub> (0-76 mg/m <sup>3</sup> )		0.66				≤2.0%
H <sub>2</sub> O (0-30 Vol.-%)		0.93				≤2.0%
O <sub>2</sub> (0-21 Vol.-%)	0.10					≤0.2%
SO <sub>2</sub> (0-75 mg/m <sup>3</sup> )			1.4			≤2.0%
SO <sub>2</sub> (0-2,858 mg/m <sup>3</sup> )		-0.91				≤2.0%
HCl (0-15 mg/m <sup>3</sup> )			1.25			≤2.0%
HCl (0-98 mg/m <sup>3</sup> )			-1.94			≤2.0%
HF (0-1.5 mg/m <sup>3</sup> )		1.00				≤2.0%
HF (0-10 mg/m <sup>3</sup> )		0.77				≤2.0%
NO <sub>2</sub> (0-40 mg/m <sup>3</sup> )		-0.67				≤2.0%
NO <sub>2</sub> (0-100 mg/m <sup>3</sup> )	-0.31					≤2.0%
CH <sub>4</sub> (0-5 mg/m <sup>3</sup> )	0.32					≤2.0%
CH <sub>4</sub> (0-20 mg/m <sup>3</sup> )		-0.53				≤2.0%

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature zero point (+5°C to +40°C)						Clause 10.14
CO	0.3					≤5.0%
CO (L)	0.4					≤5.0%
NO			1.3			≤5.0%
NH <sub>3</sub>	0.1					≤5.0%
H <sub>2</sub> O	0.2					≤5.0%
O <sub>2</sub>	-0.01					≤0.5%
SO <sub>2</sub>	-0.4					≤5.0%
HCl			1.3			≤5.0%
HF	0.1					≤5.0%
NO <sub>2</sub>			1.4			≤5.0%
CH <sub>4</sub>	0.2					≤5.0%
Influence of ambient temperature span point (+5°C to +40°C)						Clause 10.15
CO			1.1			≤5.0%
CO (L)	0.1					≤5.0%
NO		0.9				≤5.0%
NH <sub>3</sub>		-0.7				≤5.0%
H <sub>2</sub> O			-1.1			≤5.0%
O <sub>2</sub>	-0.13					≤0.50%
SO <sub>2</sub>			1.4			≤5.0%
HCl		-0.6				≤5.0%
HF			1.9			≤5.0%
NO <sub>2</sub>			-1.2			≤5.0%
CH <sub>4</sub>		-0.8				≤5.0%

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of sample gas flow for extractive CEMS						Clause 10.16
CO		-0.8				≤2.0%
CO (L)	-0.5					≤2.0%
NO		-1.0				≤2.0%
NH <sub>3</sub>	0.0					≤2.0%
H <sub>2</sub> O	-0.3					≤2.0%
O <sub>2</sub>	0.1					≤0.2%
SO <sub>2</sub>		0.5				≤2.0%
HCl		0.7				≤2.0%
HF		0.8				≤2.0%
NO <sub>2</sub>	0.4					≤2.0%
CH <sub>4</sub>	0.4					≤2.0%
Influence of voltage variations at zero (196V to 253V)						Clause 10.17
CO	0.2					≤2.0%
CO (L)	-0.3					≤2.0%
NO	0.1					≤2.0%
NH <sub>3</sub>	0.0					≤2.0%
H <sub>2</sub> O	0.0					≤2.0%
O <sub>2</sub>	-0.01					≤0.2%
SO <sub>2</sub>	0.0					≤2.0%
HCl	0.0					≤2.0%
HF	-0.2					≤2.0%
NO <sub>2</sub>	0.2					≤2.0%
CH <sub>4</sub>	0.0					≤2.0%

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*



Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of voltage variations at reference point (196V to 253V)						Clause 10.17
CO	-0.2					≤2.0%
CO (L)	-0.3					≤2.0%
NO		0.8				≤2.0%
NH <sub>3</sub>	-0.3					≤2.0%
H <sub>2</sub> O		1.0				≤2.0%
O <sub>2</sub>	0.01					≤0.2%
SO <sub>2</sub>	-0.3					≤2.0%
HCl	0.4					≤2.0%
HF		-0.7				≤2.0%
NO <sub>2</sub>	0.3					≤2.0%
CH <sub>4</sub>	-0.1					≤2.0%
Cross-sensitivity at zero with interferents: O <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub> , HCl						Clause 10.18
CO	0.0					≤4.0%
CO (L)	0.0					≤4.0%
NO		0.54				≤4.0%
NH <sub>3</sub>	0.0					≤4.0%
H <sub>2</sub> O	0.0					≤4.0%
O <sub>2</sub>	0.0					≤0.40%
SO <sub>2</sub>	0.0					≤4.0%
HCl		0.65				≤4.0%
HF			1.79			≤4.0%
NO <sub>2</sub>		0.63				≤4.0%
CH <sub>4</sub>				2.60		≤4.0%

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Cross-sensitivity at reference with interferents: O <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub> , HCl						Clause 10.18
CO			-1.96			≤4.0%
CO (L)			-1.60			≤4.0%
NO			-1.67			≤4.0%
NH <sub>3</sub>			1.46			≤4.0%
H <sub>2</sub> O				2.10		≤4.0%
O <sub>2</sub>	-0.34					≤0.40%
SO <sub>2</sub>				2.21		≤4.0%
HCl			1.19			≤4.0%
HF				3.69		≤4.0%
NO <sub>2</sub>				-3.13		≤4.0%
CH <sub>4</sub>				2.00		≤4.0%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
CO (For an ELV of 50 mg/m <sup>3</sup> )					6.3%	<7.5% (10%)
CO (L) (For an ELV of 20 mg/m <sup>3</sup> )					7.2%	<7.5% (10%)
NO (For an ELV of 50 mg/m <sup>3</sup> )					7.7%	<15% (20%)
NH <sub>3</sub> (For an ELV of 10 mg/m <sup>3</sup> )					7.5%	<30% (40%)
H <sub>2</sub> O (For a range of 0-30 Vol.-%)					5.2%	<7.5% (10%)
O <sub>2</sub> (For a range of 0-21 Vol.-%)					2.9%	<7.5% (10%)
SO <sub>2</sub> (For an ELV of 50 mg/m <sup>3</sup> )					7.4%	<15% (20%)
HCl (For an ELV of 10 mg/m <sup>3</sup> )					6.6%	<30% (40%)
HF (For an ELV of 1 mg/m <sup>3</sup> )					8.7%	<30% (40%)
NO <sub>2</sub> (For an ELV of 50 mg/m <sup>3</sup> )					9.3%	<15% (20%)
CH <sub>4</sub> (For a range of 0-5 mg/m <sup>3</sup> )					4.5%	<22.5% (30%)

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Calibration function (field)						Clause 12.1
CO					0.96	≥0.90
CO (L)					0.97	≥0.90
NO					0.98	≥0.90
NH <sub>3</sub> (0-15 mg/m <sup>3</sup> )					0.97	≥0.90
NH <sub>3</sub> (0-45 mg/m <sup>3</sup> )					0.95	≥0.90
H <sub>2</sub> O					0.92	≥0.90
O <sub>2</sub>					0.96	≥0.90
SO <sub>2</sub>					0.99	≥0.90
HCl					0.90	≥0.90
HF					0.94	≥0.90
NO <sub>2</sub>					0.96	≥0.90
CH <sub>4</sub>					0.96	≥0.90
Response time (field)						Clause 12.2
CO					60s	≤200s
CO(L)					115s	≤200s
NO					40s	≤200s
NH <sub>3</sub> (0-15 mg/m <sup>3</sup> )					128s	≤400s
NH <sub>3</sub> (0-45 mg/m <sup>3</sup> )					110s	≤400s
H <sub>2</sub> O					70s	≤200s
O <sub>2</sub>					35s	≤200s
SO <sub>2</sub>					55a	≤200s
HCl					108s	≤400s
HF					115s	≤400s
NO <sub>2</sub>					172s	≤200s
CH <sub>4</sub>					57s	≤200s

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack of fit (field)						Clause 12.3
CO	0.13					≤2.0%
CO (L)		0.93				≤2.0%
NO	0.13					≤2.0%
NH <sub>3</sub> (0-15 mg/m <sup>3</sup> )		-0.80				≤2.0%
NH <sub>3</sub> (0-45 mg/m <sup>3</sup> )		-0.67				≤2.0%
H <sub>2</sub> O			-1.33			≤2.0%
O <sub>2</sub>	0.10					≤0.2%
SO <sub>2</sub>			1.33			≤2.0%
HCl			-1.4			≤2.0%
HF			1.73			≤2.0%
NO <sub>2</sub>			-1.50			≤2.0%
CH <sub>4</sub>	0.20					≤2.0%
Maintenance interval						
CO(L), HF, NO <sub>2</sub> , CH <sub>4</sub>					1 month	Clause 12.4
CO, NO, NH <sub>3</sub> , O <sub>2</sub> , H <sub>2</sub> O, SO <sub>2</sub> , HCl					3 months	>8 days
					Note 1	
Zero and Span drift requirement	Software permits access to gain and offset adjustment using standard gas bottle, and calibration inlet. It is possible to record zero and span drift (not include). This complies with the requirements of QAL3 according to EN14181 (Note 2).					Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in zero point over maintenance interval						Clause 12.5
CO		0.6				≤3.0%
NO (0-78 mg/m <sup>3</sup> )		0.7				≤3.0%
NO (0-150 mg/m <sup>3</sup> )	0.4					≤3.0%
NH <sub>3</sub> (0-15 mg/m <sup>3</sup> )			-1.8			≤3.0%
NH <sub>3</sub> (0-45 mg/m <sup>3</sup> )		0.5				≤3.0%
H <sub>2</sub> O (0-30 Vol.-%)		0.7				≤3.0%
H <sub>2</sub> O (0-40 Vol.-%)		0.7				≤3.0%
O <sub>2</sub>	0.11					≤0.2%
SO <sub>2</sub>	0.3					≤3.0%
HCl			1.6			≤3.0%
CO (L)				-2.3		≤3.0%
HF		-0.9				≤3.0%
NO <sub>2</sub>		-0.7				≤3.0%
CH <sub>4</sub>	-0.2					≤3.0%
Change in reference point over maintenance interval						Clause 12.5
CO				2.2		≤3.0%
NO				2.4		≤3.0%
NH <sub>3</sub> (0-15 mg/m <sup>3</sup> )				2.5		≤3.0%
NH <sub>3</sub> (0-45 mg/m <sup>3</sup> )				-2.9		≤3.0%
H <sub>2</sub> O (0-30 Vol.-%)			-1.3			≤3.0%
H <sub>2</sub> O (0-40 Vol.-%)				-2.6		≤3.0%
O <sub>2</sub>	0.12					≤0.2%
SO <sub>2</sub>				2.0		≤3.0%
HCl				2.4		≤3.0%
CO (L)				2.1		≤3.0%
HF				2.1		≤3.0%
NO <sub>2</sub>			-1.6			≤3.0%
CH <sub>4</sub>			1.6			≤3.0%

Certificate No: CSA MC190347/03  
 This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
 To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Availability  CO(L), HF, NO <sub>2</sub> , CH <sub>4</sub> CO, NO, NH <sub>3</sub> , O <sub>2</sub> , H <sub>2</sub> O, SO <sub>2</sub> , HCl					96.9% 98.5%	Clause 12.6 >95%/>98% for O <sub>2</sub>
Reproducibility						Clause 12.7
CO			1.3			≤3.3%
NO			1.5			≤3.3%
NH <sub>3</sub> (0-15 mg/m <sup>3</sup> )				2.2		≤3.3%
NH <sub>3</sub> (0-45 mg/m <sup>3</sup> )			1.7			≤3.3%
H <sub>2</sub> O			1.2			≤3.3%
O <sub>2</sub>	0.10					≤0.20%
SO <sub>2</sub>	0.3					≤3.3%
HCl		0.8				≤3.3%
CO (L)			1.8			≤3.3%
HF		0.5				≤3.3%
NO <sub>2</sub>		0.8				≤3.3%
CH <sub>4</sub>				2.3		≤3.3%

Note 1: The LaserCEM has a maintenance interval of 1 to 3 months. The work must be carried out at regular intervals, depending on local conditions. This includes a visual inspection of the system and components which are monitored. If any are not within the min/max allowed, a general fault alarm will rise. A zero check and span check using a standard gas cylinder should be performed every 3 months. If the measurement error is more than 2%, a gain can be adjusted (as QAL3 requires). Refer to the user manual for this operation.

Note 2: Refer to the "Monitoring the Calibration" chapter in the user manual for details on this operation.

Note 3: When testing NH<sub>3</sub>, HCl, HF and H<sub>2</sub>O wet test gases must be used.

Certificate No: CSA MC190347/03  
This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*

## Description

The ProCeas LaserCEM is an analyser dedicated to CEMS analysis, with 4 parts:

- A CEMS Probe
- A sampling box that permits probe and line interface
- A self-heated line and gas line (for standard gas injection and protection gas injection in front of the probe)
- A full equipped analyser cabinet.

The in-situ probe uses a low pressure sampling technique to sample the gas in the stack and reduce the pressure. The lowered pressure has the following effects: lower the gas sample dew point, increase the gas speed inside the line (by around 20 times) and reduce the gas band self-broadening for spectral resolution. The sample gas is transferred via a heated line to the analyser. The line is heated to 80°C. A sample conditioning system is not required.

The gas is analysed by an infrared laser spectroscopic technique called optical feedback cavity enhanced absorption spectroscopy (OFCEAS), which is a high-resolution spectroscopic technique, with a pathlength of several kilometres. Low pressure, long path length and high spectroscopic resolution provides a linear and repeatable measurement, reduced interference, rapid 10-90 response times, and low sampling flow rates (20L/h).

## General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this certificate. 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 system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.
2. The design of the product certified is held and maintained by TÜV Rheinland for certificate No. CSA MC190347.
3. If a certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.
4. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.
5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.

Certificate No: CSA MC190347/03  
This certificate issued: 09 August 2024

*This certificate may only be reproduced in its entirety and without change  
To authenticate the validity of this certificate please visit [www.csagroupuk.org/mcerts](http://www.csagroupuk.org/mcerts)*