

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 0000038505\_01

**Certified AMS:** LasIR for HF

**Manufacturer:** Unisearch Associates Inc.  
96 Bradwick Drive  
Concord On L4K 1K8  
Canada

**Test Institute:** TÜV Rheinland Energie und Umwelt GmbH

**This is to certify that the AMS has been tested  
and found to comply with:**

**EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2007  
and EN 14181: 2004**

Certification is awarded in respect of the conditions stated in this certificate  
(see also the following pages).

The present certificate replaces Certificate No. 0000038505 of 22 March 2013

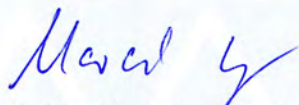


Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

www.tuv.com  
ID 0000038505

Publication in the German Federal Gazette  
(BAnz.) of 23 July 2013

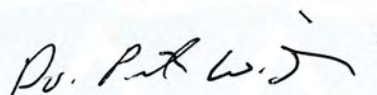
German Federal Environment Agency  
Dessau, 20 August 2013



i. A. Dr. Marcel Langner

This certificate will expire on:  
04 March 2018

TÜV Rheinland Energie und Umwelt GmbH  
Cologne, 19 August 2013



ppa. Dr. Peter Wilbring

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51105 Cologne

Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

<b>Test report:</b>	936/21216746/B of 20 February 2013
<b>Initial certification:</b>	05 March 2013
<b>Expiry date:</b>	04 March 2018
<b>Publication:</b>	BAnz AT 23 July 2013 B4, chapter I, No. 2.1

#### **Approved application**

The tested AMS is suitable for use at combustion plants according to EC directive 2001/80/EC, at waste incineration plants according to EC directive 2000/76/EC and other plants requiring official approval. The tested ranges have been chosen with respect to the wide application range of the AMS.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a six-month field test at an aluminium smelter plant.

The AMS is approved for an ambient temperature range of -20 °C to +50 °C.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the installation at which it will be installed.

#### **Basis of the certification**

This certification is based on:

- test report 936/21216746/B of 20 February 2013 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 23 July 2013 B4, chapter I, No. 2.1)

**AMS designation:**

LasIR for HF

**Manufacturer:**

Unisearch Associates, Concord, Canada

**Field of application:**

For measurements at plants requiring official approval (i.e. 2000/76/EC waste incineration directive and 2001/80/EC large combustion plants directive).

**Measuring ranges during the performance test:**

Component	Certification range	Supplementary range	Unit
HF	0 - 5*	0 - 10*	mg/m <sup>3</sup>

\*related to a measurement path length of 1.0 m

**Software version:**

4.76

**Restrictions:**

None

**Notes:**

1. HF can be tested with dry test gases from compressed gas cylinders and an unheated test gas cell.
2. The maintenance interval is three months.
3. Supplementary testing (extension of the maintenance interval) with regard to notice issued by the Federal Environment Agency dated 12 February 2013 (BANz AT 5.03.2013 B10, Chapter I Number 3.2).

**Test report:**

TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Report No.: 936/21216746/B dated 20 February 2013

### **Certified product**

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

The LasIR measuring system is a tunable infrared spectrometric diode laser system, which is made for the contactless in-situ measurement of stack emissions.

The LasIR measuring system consists of:

- LasIR control / analysis unit
- transmitter unit with purge unit
- receiver unit with purge unit
- optical cable (between analysis unit and transmitter unit)
- data cable (between the receiver unit and analysis unit)
- unheated sample gas cell

### **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 Energie und Umwelt 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 can be applied to the product or used in publicity material for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt 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**.

Certification of LasIR for HF 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. 0000038505: 22 March 2013

Expiry date of the certificate: 04 March 2018

Test report: 936/21216746/A dated 06 October 2012  
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 05 March 2013 B10, chapter I, No. 3.2  
Announcement by UBA from 12 February 2013

**Supplementary testing according to EN 15267:**

Certificate No. 0000038505\_01: 20. August 2013

Expiry date of the certificate: 04 March 2018

Test report: 936/21216746/B of 20 February 2013  
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 23 July 2013 B4, chapter I, No. 2.1  
Announcement by UBA from 03 July 2013

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

**Measuring system**

Manufacturer	Unisearch Associates Inc.	
Name of measuring system	LasIR	
Serial number of the candidates	LAS1002 / LAS1003	
Measuring principle	IR Laser	

**Test report**

Test laboratory	936/21216746/A	936/21216746/B
Date of report	TÜV Rheinland	TÜV Rheinland
	2012-10-06	2013-02-20

**Measured component**

Certification range	HF	
	0 -	5 mg/m <sup>3</sup>

**Evaluation of the cross sensitivity (CS)**

(system with largest CS)

Sum of positive CS at zero point	0.00	mg/m <sup>3</sup>
Sum of negative CS at zero point	0.00	mg/m <sup>3</sup>
Sum of positive CS at reference point	0.00	mg/m <sup>3</sup>
Sum of negative CS at reference point	0.00	mg/m <sup>3</sup>
Maximum sum of cross sensitivities	0.00	mg/m <sup>3</sup>
Uncertainty of cross sensitivity	0.000	mg/m <sup>3</sup>

**Calculation of the combined standard uncertainty**

**Tested parameter**

				u <sup>2</sup>
Standard deviation from paired measurements under field conditions *	u <sub>D</sub>	0.024	mg/m <sup>3</sup>	0.001 (mg/m <sup>3</sup> ) <sup>2</sup>
Lack of fit	u <sub>lof</sub>	-0.035	mg/m <sup>3</sup>	0.001 (mg/m <sup>3</sup> ) <sup>2</sup>
Zero drift from field test	u <sub>d,z</sub>	0.012	mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>
Span drift from field test	u <sub>d,s</sub>	-0.038	mg/m <sup>3</sup>	0.001 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of ambient temperature at span	u <sub>t</sub>	0.017	mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of supply voltage	u <sub>v</sub>	0.006	mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>
Cross sensitivity (interference)	u <sub>i</sub>	0.000	mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of sample pressure	u <sub>p</sub>	0.012	mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>
Uncertainty of reference material at 70% of certification range	u <sub>rm</sub>	0.040	mg/m <sup>3</sup>	0.002 (mg/m <sup>3</sup> ) <sup>2</sup>
Excursion of measurement beam	u <sub>mb</sub>	0.022	mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>

\* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

$$u_c = \sqrt{\sum (u_{max,j})^2}$$

Combined standard uncertainty (u<sub>c</sub>)

Total expanded uncertainty

	0.08	mg/m <sup>3</sup>
U = u <sub>c</sub> * k = u <sub>c</sub> * 1.96	0.15	mg/m <sup>3</sup>

**Relative total expanded uncertainty**

Requirement of 2000/76/EC and 2001/80/EC

Requirement of EN 15267-3

U in % of the ELV 1 mg/m <sup>3</sup>	15.2
U in % of the ELV 1 mg/m <sup>3</sup>	40.0
U in % of the ELV 1 mg/m <sup>3</sup>	30.0