

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 000028731\_01

**Certified AMS:** D-R 800 for dust

**Manufacturer:** DURAG GmbH  
Kollastraße 105  
22453 Hamburg  
Germany

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

**This is to certify that the AMS has been tested and certified according to the standards**

**EN 15267-1 (2009), EN 15267-2 (2009), EN 15267-3 (2008)  
and EN 14181 (2004)**

Certification is awarded in respect of the conditions stated in this certificate  
(this certificate contains 6 pages).



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

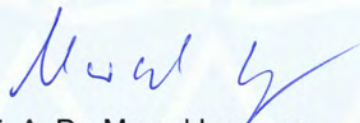
www.tuv.com  
ID 000028731

Publication in the German Federal Gazette  
(BAnz.) of 26 January 2011

This certificate will expire on:  
25 January 2021

German Federal Environment Agency  
Dessau, 21 January 2016

TÜV Rheinland Energie und Umwelt GmbH  
Cologne, 20 January 2016



i. A. Dr. Marcel Langner



ppa. Dr. Peter Wilbring

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51105 Cologne

Test institute accredited to EN ISO/IEC 17025:2005 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.

<b>Test report:</b>	936/21212470/A of 1 October 2010
<b>Initial certification:</b>	26 January 2011
<b>Certificate:</b>	renewal (previous certificate 0000028731 of 9 February 2011 valid until 25 January 2016)
<b>Expiry date:</b>	25 January 2021
<b>Publication:</b>	BAnz. 26 January 2011, No. 14, p. 294, Chapter I No. 1.1

### **Approved application**

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13. BImSchV), at waste incineration plants according to Directive 2010/75/EU, chapter IV (17. BImSchV) and other plants requiring official approval. The measured ranges have been selected considering 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 three-month field test on municipal waste incineration plant.

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 valid at the time of performance testing. As changes in legal regulations are possible, any potential user should ensure 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 this AMS is suitable for the installation at which it will be installed.

### **Basis of the certification**

This certification is based on:

- test report 936/21212470/A dated 1 October 2010 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. 26 January 2011, No. 14, p. 294, Chapter I No. 1.1  
UBA announcement from 10 January 2011:

**AMS name:**

D-R 800 for dust

**Manufacturer:**

DURAG GmbH, Hamburg

**Approval:**

For measurements at plants requiring official permission and plants according to 27th BImSchV.

**Measuring ranges during the suitability test:**

Component	Measuring range
dust (scattered light)	0 – 15 mg/m <sup>3</sup> $\hat{=}$ 0 – 100 % T (reference measuring range)

**Software version:**

1.76

**Remarks:**

1. A measuring range of 0 – 16.5 mg/m<sup>3</sup> was found during manual calibration.
2. The maintenance interval is two months.
3. Supplementary test to the announcement of the German Federal Environmental Agency from 12 April 2007 (BAnz. p. 4139, Chapter I No. 1.1) due to the transfer to EN 15267.
4. The measuring system did not meet the requirements of the determination coefficient of the calibration function R<sup>2</sup> according to EN 15267.

**Test report:**

TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Report-No.: 936/21212470/A of 1 October 2010

Publication in the German Federal Gazette: BAnz AT 05.03.2013 B10, chapter V notification 20,  
UBA announcement from 12 February 2013:

**20 Notification as regards Federal Environmental Agency notice of 10 January 2011  
(Federal Gazette (BAnz.) p. 294, chapter I, No. 1.1)**

The current software version of the D-R 800 dust measuring system manufactured by DURAG GmbH is:

V1.77

Statement of TÜV Rheinland Energie und Umwelt GmbH dated 15 October 2012

Publication in the German Federal Gazette: BAnz AT 01.04.2014 B12, chapter VI notification 9, UBA announcement from 27 February 2014:

**9 Notification on the announcements of the Federal Environment Agency of 10 January 2011 (BAnz. p. 294, Chapter I Number 1.1) and of 12 February 2013 (BAnz AT 05.03.2013 B10, Chapter V 20<sup>th</sup> notification)**

The D-R 800 measuring system by DURAG GmbH has been revised. It has been equipped with a new lens and an adjusted collimator. The measuring system can now be used for exhaust temperature up to 350 °C, for which a new optical cable was fitted and the materials for the seal and a ferrule were adjusted. Furthermore, the coating of the probe tip components was revised.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 30 September 2013

**Certified product**

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

- measuring rod
- supply unit
- connecting cable
- purge air tube
- welding flange

The measuring system D-R 800 uses the principle of forward scattering. The bundled and modulated light of a laser diode (Laser Protection Class II) radiographs the measuring volume. The light (measuring light) scattered by dust particles is mainly scattered forward, therefore here the receiver lens is mounted.

The measuring light is integrated by time. The integration time is adjustable between 5 s and 1800 s. Four measuring ranges are possible. During the startup the user chooses a measuring range, where for all operating conditions no concentrations above the range are to be expected.

For the temperature compensation a constant can be programmed or an external temperature transmitter (4-20 mA) can be used. The averaged and compensated measuring signal is the scattered light (without unit).

The voltage outputs can be parameterised to the designated measuring range. To show the dust concentration in mg/m<sup>3</sup> on the D-R 800, a factor and an offset can be set for the conversion from scattered light into mg/m<sup>3</sup>.

Every 5 min a contamination check is done, to measure the dust accumulation on the optical boundary surfaces and the deterioration of the optical elements.

**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](http://qal1.de).

Certification of D-R 800 for dust is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

**First suitability test:**

Test report: 936/21205307/A of 7 July 2006  
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne  
Publication: BAnz. 14 October 2006, No. 194, p. 6715, Chapter I No. 1.1  
Announcement by UBA from 12 September 2006

**Supplementary test:**

Test report: 936/21205307/B of 13 December 2006  
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne  
Publication: BAnz. 20 April 2007, No. 75, p. 4139, Chapter I No. 1.1  
Announcement by UBA from 12 April 2007

**Notification:**

Statement of TÜV Rheinland Immissionsschutz und Energiesysteme from 11 March 2008  
Publication: BAnz. 3 September 2008, No. 133, p. 3243, Chapter III notification 2  
Announcement by UBA from 12 August 2008 (software update)

**Initial certification according to EN 15267:**

Certificate No. 0000028731: 9 February 2011  
Validity of the certificate until: 25 January 2016  
Test report: 936/21212470/A of 1 October 2010,  
TÜV Rheinland Energie und Umwelt GmbH, Cologne,  
Publication: BAnz. 26 January 2011, No. 14, p. 294, Chapter I No.1.1:  
Announcement by UBA from 10 January 2011

**Notification:**

Statement of TÜV Rheinland Energie und Umwelt GmbH from 15 October 2012,  
Publication BAnz AT 05.03.2013 B10, chapter V notification 20,  
Announcement by UBA from 12 February 2013

Statement of TÜV Rheinland Energie und Umwelt GmbH from 30 September 2013,  
Publication BAnz AT 01.04.2014 B12, chapter VI notification 9,  
Announcement by UBA from 27 February 2014

**Renewal of the certificate:**

Certificate No.: 0000028731\_01: 21 January 2016  
Validity of the certificate: 25 January 2021

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

**Measuring system**

Manufacturer	DURAG GmbH
Name of measuring system	D-R 800
Serial number of the candidates	8000020 / 8000022 / 1214983 / 1214985
Measuring principle	scattered light

**Test report**

Test laboratory	TÜV Rheinland
Date of report	2010-10-01

**Measured component**

Certification range	Dust	0 - 15 mg/m <sup>3</sup>
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**Calculation of the combined standard uncertainty**

**Tested parameter**

	u	u <sup>2</sup>
Standard deviation from paired measurements under field conditions *	u <sub>D</sub> 0.136 mg/m <sup>3</sup>	0.018 (mg/m <sup>3</sup> ) <sup>2</sup>
Lack of fit	u <sub>lof</sub> -0.173 mg/m <sup>3</sup>	0.030 (mg/m <sup>3</sup> ) <sup>2</sup>
Zero drift from field test	u <sub>d,z</sub> 0.035 mg/m <sup>3</sup>	0.001 (mg/m <sup>3</sup> ) <sup>2</sup>
Span drift from field test	u <sub>d,s</sub> 0.064 mg/m <sup>3</sup>	0.004 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of ambient temperature at span	u <sub>t</sub> 0.058 mg/m <sup>3</sup>	0.003 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of supply voltage	u <sub>v</sub> 0.038 mg/m <sup>3</sup>	0.001 (mg/m <sup>3</sup> ) <sup>2</sup>
Uncertainty of reference material at 70% of certification range	u <sub>rm</sub> 0.121 mg/m <sup>3</sup>	0.015 (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"

Combined standard uncertainty (u <sub>c</sub> )	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.27 mg/m <sup>3</sup>
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.53 mg/m <sup>3</sup>

**Relative total expanded uncertainty**

<b>Requirement of 2000/76/EC and 2001/80/EC</b>	<b>U in % of the ELV 10 mg/m<sup>3</sup></b>	<b>5.3</b>
<b>Requirement of EN 15267-3</b>	<b>U in % of the ELV 10 mg/m<sup>3</sup></b>	<b>30,0</b>
	<b>U in % of the ELV 10 mg/m<sup>3</sup></b>	<b>22,5</b>