

# CERTIFICATE

about Product Conformity (QAL1)

Number of Certificate: 0000028731

**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 certifying that the AMS has been tested  
and found to comply with:**

**EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2008  
und EN 14181: 2004**

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



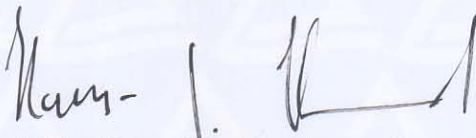
- EN 15267-3 tested
- QAL1 certified
- TUV approved
- Annual inspection

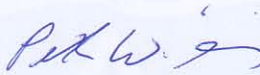
Publication in the German Federal Gazette  
(BAnz.) of 26 January 2011

The certificate is valid until: 25 January 2016

Umweltbundesamt  
Dessau, 9 February 2011

TÜV Rheinland Energie und Umwelt GmbH  
Köln, 7 February 2011

  
i. A. Dr. Hans-Joachim Hummel

  
ppa. Dr. Peter Wilbring

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

<b>Test report:</b>	936/21212470/A of 1 October 2010
<b>First certification:</b>	26 January 2011
<b>Run of validity until:</b>	25 January 2016
<b>Publication</b>	BAnz. 26 January 2011, No. 14, p. 294, Chapter I No. 1.1

#### **Approved application**

The certified AMS is suitable for use at combustion plants according to EC directive 2001-80-EC, at waste incinerations plants according to EC directive 2000-76-EC and other plants requiring official permission. 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 three months field test on municipal waste incineration plant.

The AMS is approved for the temperature range from -20 °C to +50 °C.

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

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

This certification is based on the test report 936/21212470/A of 1 October 2010 of TÜV Rheinland Energie und Umwelt GmbH, on the relevant body (Federal Environment Agency of Germany) assessment and ongoing surveillance of the product and the manufacturing process and the publication in the German Federal Gazette (BAnz. 26 January 2011, No. 14, p. 294, Chapter I No. 1.1: Announcement by UBA 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 27 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, Köln  
Report-No.: 936/21212470/A of 1 October 2010

**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  $\text{mg}/\text{m}^3$  on the D-R 800, a factor and an offset can be set for the conversion from scattered light into  $\text{mg}/\text{m}^3$ .

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 certified product is found no longer to comply with the applicable European Standard, TÜV Rheinland Energie und Umwelt GmbH should be notified at the address shown on page 1.

The certification mark with the product specific ID-Number that can be applied to the product or used in publicity material for the certified product is presented on page 1 of this certificate.

This document as well as the certification mark remains the property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the validity 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 the validity is also seen at the Internet Address: [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, Köln

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  
Maintenance interval extension up to 2 months  
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Köln

Publication: BAnz. 20 April 2007, No. 75, p. 4139, Chapter I No. 1.1:  
Announcement by UBA from 12 April 2007.

**Notification:**

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, Köln,

Publication: BAnz. 26 January 2011, No. 14, p. 294, Chapter I No.1.1:  
Announcement by UBA from 10 January 2011.

**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>
Requirement of EN 15267-3	U in % of the ELV 10 mg/m <sup>3</sup>	30.0
	U in % of the ELV 10 mg/m <sup>3</sup>	22.5