Umwelt Bundes Amt
For our Environment

TÜVRheinland®
Precisely Right.

CERTIFICATE

about Product Conformity (QAL1)

Number of Certificate: 0000028731

Certified AMS:	D-R 800 for dust
Manufacturer:	DURAG GmbH Kollaustraße 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).

www.tuv.com TÜVRheinland® ID: 0000028731

- 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

i. A. Dr. Hans-Joachim Hummel

TÜV Rheinland Energie und Umwelt GmbH
Köln, 7 February 2011

ppa. Dr. Peter Wilbring

www.umwelt-tuv.de / www.eco-tuv.com teu@umwelt-tuv.de Tel. +49 - 221 - 806 - 2275	TÜV Rheinland Energie und Umwelt GmbH Am Grauen Stein 51105 Köln
Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.	

10/221 2.08

Test report:	936/21212470/A of 1 October 2010
First certification:	26 January 2011
Run of validity until:	25 January 2016
Publication	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/m³ ≙ 0 – 100 % T (reference measuring range)

Software version:
1.76

Remarks:
1. A measuring range of 0 – 16.5 mg/m³ 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^2 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 mg/m³ on the D-R 800, a factor and an offset can be set for the conversion from scattered light into mg/m³.

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 looses 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**.

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	936/21212470/A				
Test laboratory	TÜV Rheinland				
Date of report	2010-10-01				
Measured component	Dust				
Certification range	0 -	15	mg/m³		

Calculation of the combined standard uncertainty

Tested parameter		u		u²	
Standard deviation from paired measurements under field conditions *	u_D	0.136	mg/m³	0.018	(mg/m³)²
Lack of fit	u_{lof}	-0.173	mg/m³	0.030	(mg/m³)²
Zero drift from field test	$u_{d,z}$	0.035	mg/m³	0.001	(mg/m³)²
Span drift from field test	$u_{d,s}$	0.064	mg/m³	0.004	(mg/m³)²
Influence of ambient temperature at span	u_t	0.058	mg/m³	0.003	(mg/m³)²
Influence of supply voltage	u_v	0.038	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

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max\ j})^2}$	0.27	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.53	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 10 mg/m³**	**5.3**
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