Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000028731_02

AMS designation:	D-R 800 for dust
Manufacturer:	DURAG GmbH Kollaustraße 105 22453 Hamburg Germany
Test Laboratory:	TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested and found to comply with the standards 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 (this certificate contains 8 pages).
The present certificate replaces certificate 0000028731_01 of 21 January 2016.

TÜVRheinland® CERTIFIED

Suitability Tested
EN 15267
QAL1 Certified
Regular
Monitoring

www.tuv.com
ID 0000028731

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

This certificate will expire on:
25 January 2026

German Federal Environment Agency
Dessau, 25 January 2021

Dr. Marcel Langner
Head of Section II 4.1

TÜV Rheinland Energy GmbH
Cologne, 24 January 2021

ppa. Dr. Peter Wilbring

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Test institute accredited to EN ISO/IEC 17025 by DAkkS (German Accreditation Body).
This accreditation is limited to the accreditation scope defined in the enclosure to certificate D-PL-11120-02-00.

Test Report:	936/21212470/A dated 1 October 2010
Initial certification:	26 January 2011
Expiry date:	25 January 2026
Certificate:	Renewal (of previous certificate 0000028731_01 dated 21 January 2016 valid until 25 January 2021)
Publication:	BAnz. 26 January 2011, no. 14, p. 294, chapter I number 1.1

Approved application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13th BImSchV), chapter IV (17th BImSchV), 30th BImSchV, 44th BImSchV, plants in compliance with TA Luft and plants according to the 27th BImSchV. The measured ranges have been selected so as to ensure as broad a field of application as possible.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-months field test at a 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 applicable at the time of testing. As changes in legal provisions are possible, any potential user should ensure that this AMS is suitable for monitoring the limit values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended purpose.

Basis of the certification

This certification is based on:

- Test report no. 936/21212470/A dated 1 October 2010 issued by 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 number 1.1, UBA announcement dated 10 January 2011:

AMS designation:
D-R 800 for dust

Manufacturer:
DURAG GmbH, Hamburg

Field of application:
For plants requiring official approval and for plants according to the 27th BImSchV

Measuring ranges during performance testing:

Component	Measuring range
Dust (scattered light)	0–15 mg/m³ ≙ 0 – 100 % T (reference measuring range)

Software version:
1.76

Notes:
1. Manual calibrations resulted in a measuring range of ~ 0–16.5 mg/m³
2. The maintenance interval is two months.
3. Supplementary testing as regards Federal Agency Notice of 12 April 2007 (BAnz. p. 4139, chapter I number 1.1) related to the applicability of standard EN 15267.
4. The requirement for the determination coefficient R^2 of the calibration function in accordance with EN 15267-3 was not satisfied.

Test Report:
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report no.: 936/21212470/A dated 1 October 2010

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

20 Notification as regards Federal Environment Agency (UBA) notices of 10 January 2011 (BAnz. p. 294, chapter I number 1.1)

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

V1.77

Statement issued by 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 dated 27 February 2014:

9 Notification as regards Federal Environment Agency (UBA) notices 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 20th notification)

The D-R 800 measuring system manufactured by DURAG GmbH has been revised. It has been equipped with a lens and an adapted collimator. It can be used for waste gas temperatures up to 350 °C. To this effect a new optical fibre was used and the materials for seals and a clamp ring have been adapted. Furthermore the coating of components in the probe tip has changed.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 30 September 2013

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, chapter IV notification 9, UBA announcement dated 27 February 2019:

9 Notification as regards Federal Environment Agency (UBA) notices of 10 January 2011 (BAnz. p. 294, chapter I number 1.1) and of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter VI 9th notification)

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

1.79

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 10 October 2018

Certified product
This certification applies to automated measurement systems conforming to the following description:

In its performance-tested version, the D-R 800 measuring system consists of the following components:

- Measuring rod
- Supply unit
- Connection cable
- Purge air tube
- Welding flange

The D-R 800 uses the principle of forward scattering. Focussed modulated light of a laser diode (laser protection class II) beams through the measurement volume. The light scattered by dust particles (measuring light) is mostly scattered forward, therefore the receiving lens is located here.

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 start-up 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 minutes, a contamination check is done to measure the dust accumulation on the optical boundary surfaces and the deterioration of the optical elements.

General remarks
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 manufacturing process for 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 Energy 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 document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at **qal1.de**.

Document history

Certification of the D-R 800 measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

Basic testing

Test Report: 936/21205307/A dated 7 July 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 14 October 2006, no. 194, p. 6715, chapter I number 1.1
UBA announcement dated 12 September 2006

Supplementary testing

Test Report: 936/21205307/B dated 13 December 2006
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 20 April 2007, no. 75, p. 4139, chapter I number 1.1
UBA announcement dated 12 April 2007

Notification:

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 11 March 2008
Publication: BAnz. 3 September 2008, no. 133, p. 3243, chapter III notification 2
UBA announcement dated 12 August 2008 (Software changes)

Initial certification according to EN 15267

Certificate no. 0000028731: 09 February 2011
Expiry date of the certificate: 25 January 2016
Test report no. 936/21212470/A dated 01 October 2010
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz. 26 January 2011, No. 14, p. 294, chapter I number 1.1
UBA announcement dated 10 January 2011:

Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 15 October 2012
Publication: BAnz AT 05.03.2013 B10, chapter V notification 20
UBA announcement dated 12 February 2013
(software updates)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 30 September 2013
Publication: BAnz AT 01.04.2014 B12, chapter VI notification 9
UBA announcement dated 27 February 2014
(Design changes)

Renewal of the certificate

Certificate no. 0000028731_01: 21 January 2016
Expiry date of the certificate: 25 January 2021

Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energy GmbH dated 10 October 2018
Publication: BAnz AT 26.03.2019 B7, chapter IV notification 9
UBA announcement dated 27 February 2019
(software updates)

Renewal of the certificate

Certificate no. 0000028731_02:	25 January 2021
Expiry date of the certificate:	25 January 2026

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_{lnf}	-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