



**ENVIRONMENT
AGENCY**

Method Implementation Document (MID 13284-2)

BS EN 13284-2: Stationary source emissions
Determination of low range mass concentration of dust
Part 2: Automated measuring systems

**Environment Agency
Version 1
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Foreword

BS EN 13284-2 defines the requirements for carrying out the calibration of continuous particulate monitors used on installations falling under the Large Combustion Plant and Waste Incineration Directives.

This Method Implementation Document (MID) is one of a series being produced by the Environment Agency to supplement, where necessary, European and international monitoring standards to ensure organisations carrying out regulatory monitoring implement the standards consistently.

Testing laboratories carrying out the procedures specified by BS EN 13284-2 for installations regulated by the Environment Agency shall follow the requirements of the standard, this MID, BS EN13284-1, MID13284-1, BS EN14181, MID14181 and our *Technical Guidance Note M20, Quality assurance of CEMs*.

We require all testing laboratories carrying out Standard Reference Method (SRM) measurements for the purposes of applying BS EN 14181 and BS EN 13284-2 to be accredited to BS EN ISO/IEC 17025 for the MCERTS standard for manual stack emission monitoring for the applicable SRMs.

If you have any general questions about BS EN 13284-2 or this MID please contact:

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Introduction

British Standard BS EN 13284-2 describes the quality assurance procedures for continuous emission monitoring systems (CEMs) for the determination of particulate in flue gases, in order to meet the uncertainty requirements on measured values specified by the Large Combustion Plant and Waste Incineration Directives. BS EN 13284-2 is an application of BS EN 14181 for the quality assurance of CEMs.

The calibration and validation of particulate-monitoring CEMs are performed mainly through parallel measurements using the SRM specified in BS EN 13284-1, supplemented by MID13284-1.

Testing laboratories carrying out the procedures specified by BS EN 13284-2 for installations regulated by the Environment Agency shall follow the requirements of the standard, this MID, BS EN13284-1, MID13284-1, BS EN14181, MID14181 and our *Technical Guidance Note M20, Quality assurance of CEMs*.

This MID supplements BS EN 13284-2 and its provisions reflect the clause numbers in this standard, but does not re-state all of its provisions.

We require all testing laboratories carrying out Standard Reference Method (SRM) to BS EN13284-2 to be accredited to BS EN ISO/IEC 17025 for the MCERTS standard for manual stack emission monitoring for the applicable SRMs.

1 Scope

BS EN 13284-2 shall be used on all installations covered by the following EU directives;

- Directive on the limitation of emissions of certain pollutants into the air from large combustion plants (2001/80/EC) (LCPD).
- Directive on the incineration of waste (2000/76/EC) (WID).

2 Normative references

- MCERTS – Manual stack-emission monitoring performance standard for organisations. Environment Agency.
- MCERTS – Personnel competency standard for manual stack-emission monitoring. Environment Agency.
- MCERTS – Performance standards for continuous emission monitoring systems. Environment Agency.
- MCERTS – Procedures and general requirements for the compliance testing of continuous emission monitoring systems. Environment Agency.
- MCERTS – Performance standards for portable systems for emission monitoring.

Environment Agency.

- Technical Guidance Note M1: Sampling requirements for monitoring stack emissions to air from industrial installations. Environment Agency.
- Technical Guidance Note M2: Monitoring of stack emissions to air. Environment Agency.
- Technical Guidance Note M20: Selection, installation, calibration and quality assurance of continuous emission monitoring systems. Environment Agency.

The latest versions of the above documents are available from the Environment Agency's web site www.mcerts.net

3 Terms and definitions

3.8 reproducibility under field conditions

Reproducibility as defined in EN13284-2 is an absolute measure of the variation in mg.m^{-3} between two identical instruments operating in the same process. This is different to the definition used in the MCERTS performance standards for CEMs.

4 Principle

No additional requirements

5 CEM performance criteria (QAL1)

The performance of the CEM shall be assessed in a suitability test referred to as QAL1. This requirement is fulfilled by using equipment that has been certified to the MCERTS performance standards for CEMs.

In addition for particulate monitoring CEMs:

- It must be possible to perform the linearity test in the AST using suitable reference materials.
- The zero and span check procedures must meet the QAL3 requirements.

6 AMS location

The location of a non-intrusive CEM shall be within 1x duct diameter or 1 metre, whichever is smaller, upstream of the sample ports for the manual sampling and generally vertically in line with one of the manual sample ports. The manufacturer's recommendation must also be taken into account when locating an intrusive CEM.

The location of an intrusive CEM shall be within 2x duct diameters or 2 metres, whichever is smaller, upstream of the sample ports for the manual sampling and generally at 45° to one of

the manual sample ports. The manufacturer's recommendation must also be taken into account when locating an intrusive CEM.

Note: When introducing the sample probe during the calibration of an intrusive device, the output must be monitored to assure that there is no variation due to probe interference.

On installations with large ducts – for example, on some power stations, the ducts may be 6m or more in diameter - the CEMs are sometimes installed on one level, whilst the SRM sampling points are on another level. This would be outside the requirement stated above. When this is the case, the suitability of the location shall be verified by carrying out a flow profile in accordance with BS EN13284-1 to assure that the profiles are equivalent. When this exercise is carried out, it is important that a second flow device is fitted during the tests to compensate for temporal variations in the process.

Note: The above requirement is necessary, because if these profiles differ significantly, then the SRM and the CEM will not be measuring the same particulate concentration. This in turn could lead to the CEMs failing the QAL2 tests, as well as an erroneous calibration.

7 QAL2

7.1 General

Understanding of the process and conditions of the particulate is extremely important or the resulting calibration may not be characterised to the particulate being monitored by the CEM. Poor implementation of the SRM will also give a false calibration.

In the case where all measurements are below 30 % of the ELV, the number of measurements may be reduced, but to not less than 5 measurements over 3 days. The total extraction time should be at least 7h 30 min i.e. 1hr 30 min per test or the calculated sample time based on the weighing uncertainty (refer BS EN13284-1 and MID 13284-1), whichever is the greatest.

When the emissions are below 30% of the ELV the calibration range may be extended to the 30% point by extrapolation; for example, if the process has an ELV of 50mg.m^{-3} and generally runs at 5mg.m^{-3} the the range can be extended up to 15mg.m^{-3} .

7.2 Calibration procedure

7.2.1 Parallel measurements with SRM

Note the requirement for rinsing of the sampling equipment upstream of the filter is after **each** test.

7.2.2 Automatic recording of output data from the AMS dust monitor

No additional requirements.

7.2.2.1 General

No additional requirements.

7.2.2.2 Continuous CEMs

To avoid errors due to data recording, the rate at which data is recorded from the instrument shall be at least twice as fast as the CEM measurement rate.

7.2.2.3 Calibration of discontinuous CEMs

No additional requirements.

7.3 Establishing the calibration function

7.4 Calibration under abnormal operating conditions

7.4.1 General

Changes in operational conditions which influence the calibration function of the CEM shall be avoided unless they can be demonstrated to be fully representative of the change in conditions which occur under all types of arrestment plant failure and not exceed the ELV.

7.4.2 Parallel measurements

The calibration range can be extended by 10% or up to 30% of the ELV whichever is greater; refer to section 7.1.

7.4.3 Calibration function

No additional requirements.

7.4.4 Variability test

No additional requirements.

7.5 Special circumstances for fulfilling the variability test

7.5.1 General

No additional requirements.

7.5.2 Exceptional conditions during calibration

No additional requirements.

7.5.3 Occurrence of semi volatile particulate matter.

Refer to section 9 in BS EN13284-1.

8 Ongoing quality assurance during operation (QAL3)

BS EN14181 gives two examples to demonstrate ongoing quality assurance. The manufacturer can implement any procedure within the CEM that will confirm that the precision and drift as specified in QAL1 has remained within the original QAL1 requirements. Data values must be stored for audit purposes at the next AST.

9 Annual surveillance test, AST

No additional requirements.