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Methods for

The measurement of air pollution —

Part 1: Deposit gauges

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British Cast Iron Research Association	Heating and Ventilating Contractors Association
British Coal Utilisation Research Association	Imperial Chemical Industries Limited*
British Coke Research Association	Institute of British Foundrymen
British Electrical and Allied Manufacturers' Association	Institute of Fuel*
British Ironfounders' Association	Institution of Gas Engineers*
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Coke Oven Managers' Association	National Coal Board*
Council of Ironfoundry Associations	Society of British Gas Industries
Domestic Solid Fuel Appliances Approval Council	Water-tube Boilermakers' Association
Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales*	Women's Advisory Council on Solid Fuel

The Government department and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Association of Public Health Inspectors	London Transport Board
Confederation of British Industry	Ministry of Power
Department of Employment and Productivity (Factory Inspectorate)	Ministry of Technology — Laboratory of the Government Chemist
Greater London Council	Ministry of Technology — Warren Spring Laboratory
Institution of Electrical Engineers	National Society for Clean Air
Institution of Municipal Engineers	

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Foreword

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 9,000, fully indexed and with a note of the contents of each, will be found in the BSI Catalogue which may be purchased from BSI Sales Department. The Catalogue may be consulted in many public libraries and similar institutions.

This standard makes reference to the following British Standards:

BS 1449, *Steel plate, sheet and strip — Part 4: Stainless and heat resisting plate, sheet and strip*.

BS 3014, *‘As welded’ and cold drawn welded austenitic stainless steel tubes for mechanical, structural and general engineering purposes*.

Serious damage may be caused by polluting materials discharged into the atmosphere from various sources. Such emissions can adversely affect agricultural land and crops, can soil clothing and buildings, can corrode metal installations and can have a harmful effect on the health of the community.

It was suggested, therefore, by interested authorities that, to assist those engaged in dealing with this national problem, the British Standards Institution should undertake the standardization of apparatus for the measurement of air pollution. It was further suggested that such apparatus should be convenient for use by technical colleges and similar institutions in order to promote widespread knowledge of the extent of air pollution.

The pollutants emitted into the air may be arbitrarily classified as follows:

- 1) Solid material, such as grit, coarse enough to settle out fairly rapidly. The quantity of such material may be assessed by the method described in Part 1 of this standard.
- 2) Finer material which tends to remain suspended in the air but can be collected by filtration. Such material is commonly known as “smoke” and in extreme cases it can limit visibility or cause blackening of buildings and clothing. A method of quantitative assessment will be found in Part 2 of this standard.
- 3) Gaseous impurities, which can be separated from the air by chemical means. An example of such impurities is sulphur dioxide, which causes corrosion and presents a health hazard. A method for the determination of this pollutant will be found in Part 3 of this standard.

The determination of some other harmful gaseous constituents of the atmosphere is dealt with in Part 4 of this standard.

Consideration is being given to the development of a procedure for the determination of light air-borne particles (“dust”) and of the influence of environmental factors on their deposition.

NOTE Where imperial equivalents are stated, the figures in metric units are to be regarded as the standard. Accurate conversions should be based on the tables in BS 350, “Conversion factors and tables”.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 9 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Introduction

Because of the problems arising from the discharge of coarse material into the atmosphere from fuel burning appliances and other sources, methods of assessing the deposition of such material, commonly known as grit and dust, were considered before those for fine material and gaseous impurities and a specification covering the construction and use of deposit gauges was issued in 1951.

Enquiries relating to the gauges currently in operation and experience in their use have indicated that certain modifications to the original standard might advantageously be made. These have been incorporated in the present standard but it is not intended that gauges already in use should thereby be rendered obsolete. A number of alternative and in some cases simpler designs have been suggested, but until comparable results have been obtained by experience it has not been considered desirable to make any radical change in the existing standard design.

The precise measurement of the solid material deposited at any particular site is difficult and it should be noted that the amount collected and retained in a deposit gauge is influenced by factors such as the height of the gauge above ground, the nature of the site and the meteorological conditions, e.g. wind force and rainfall. These factors have to be borne in mind when any comparison is made of the quantity of deposit measured at different sites, or even at the same site under varying weather conditions, but such comparisons may be valid in relation to known circumstances, especially when results are averaged over several months.

When a gauge is suitably sited, the observed amount of deposition can reasonably be regarded as being representative of a larger area than that actually covered by the gauge. The period of exposure is commonly called a calendar month, but this is a variable number of days and for purposes of comparison the results may be suitably expressed in terms of the average daily rate of deposition. A convenient unit is milligrammes of deposit per square metre per day ($\text{mg}/\text{m}^2 \text{ d}$).

1 Scope

This Part of this British Standard specifies requirements for the construction, installation and use of the deposit gauge for the collection and measurement of atmospheric impurities that are deposited by their own weight or with the assistance of rain. The gauge also provides an estimate of the rainfall.

A standard report form and a statement of the analytical determinations to be made are included.

2 Apparatus

2.1 Outfit. The complete deposit gauge outfit shall comprise the following:

- 1 Stand
- 1 Collecting bowl
- 3 Collecting bottles
- 1 Inverted funnel
- 1 Length of flexible tubing
- 1 Brush and plug
- 1 Rubber squeegee.

2.2 Stand. The stand shall be made of mild steel, to the dimensions shown in Figure 1, and shall be galvanized after the components have been joined together. The bird-guard shall be of about 25 mm mesh and shall be attached to the body of the stand. It shall be constructed of a corrosion resistant material, e.g. a plastics material. Galvanized wire netting has been found unsatisfactory owing to its liability to corrosion in service.

Suitable supports shall be provided on the shelf to decrease the likelihood of accidental dislodgement of the collecting bottle.

2.3 Collecting bowl. The collecting bowl shall be made of chemically resistant glass or of a suitable plastics material not prone to the accumulation of electrostatic charge and shall be to the dimensions shown in Figure 2. Each collecting bowl shall be indelibly marked with a serial number and a conversion factor shall be supplied for each bowl, such that the weight of deposit collected, in milligrammes, when multiplied by the factor will represent milligrammes per square metre (mg/m^2). The same factor can also be used to convert litres (l) of water to millimetres (mm) of rainfall (see footnote to Clause 6).

The conversion factor shall be obtained from the "mean effective diameter" of the collecting bowl, which shall be determined by measuring the internal and external diameters in millimetres of the bowl at 12 points round the circumference and taking the mean, D , of the 24 readings. The measurements shall be made to the nearest millimetre. The factor shall then be calculated from the formula:

$$\text{Factor} = \frac{127.3 \times 10^4}{D^2}$$