STANDARD **9931**

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Coal — Sampling of pulverized coal conveyed by gases in direct fired coal systems

Charbon — Échantillonnage de charbon pulvérisé transporté par des gaz dans des systèmes à combustion directe de charbon

Reference number
ISO 9931:1991(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9931 was prepared by Technical Committee ISO/TC 27, *Solid mineral fuels*.

Annexes A, B and C of this International Standard are for information only.

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Introduction

This International Standard was developed for use in determining the distribution of pulverized coal between separate burners in a coal-fired power station.

Sampling in accordance with this International Standard can give information about performance characteristics of a pulverized coal firing system, for example

— when commissioning fuel distribution systems and firing systems with a view to equal fuel distribution to the burners;

— when monitoring and adjusting the performance of dividers and baffles in fuel distribution systems;

— when monitoring pulverizer performance for specified particle size.

NOTE 1 The sampler and the sampling method described in this International Standard were developed for the sampling of pulverized coals. However, this does not preclude this International Standard from being suitable for sampling pulverized material other than coal, conveyed by air or other gases in circular pipes. At present, however, no experience or experimental results for pulverized materials other than coal are available.

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Coal — Sampling of pulverized coal conveyed by gases in direct fired coal systems

1 Scope

This International Standard specifies a method which, subject to limitations imposed by the geometry of the pulverized-coal pipe, is applicable to multipoint sampling of pulverized coal suspended in air or other gases conveyed in circular pipes between pulverizer and burners in direct fired coal systems in power stations. The samples collected are used for deriving the mass distribution of coal between the burners and the particle size distribution of the coal, with the object of determining the performance of a pulverizer.

The method is suitable for sampling from vertical circular pipes at, or beyond, a specified distance from a flow disturbance when

— the maximum particle size to be sampled is less than one-third of the diameter of the sampler tip aperture, i.e. less than 1,5 mm (to ensure representative sampling and to avoid clogging of the sampler);

— sampling takes place in a circular pipe with an internal diameter between 250 mm and 700 mm;

— the air/coal ratio in the pipe is within the normal range of direct fired pulverized coal systems.

NOTE 2 If sampling access can only be made at an unsuitable position, depending upon the purpose of the measurement, the equipment may still give satisfactory results. In such positions a more detailed investigation may be necessary. This may involve taking individual samples covering the full cross-section of the pipe using some other method, including a single tip sampler.

2 Principle

A multipoint sampler extracts, in 4 min, one representative sample from 64 sampling points evenly distributed over a cross-section of a circular pipe. Suitable sampling positions are described. The sampler is inserted through a dustless connection into the pulverized fuel pipe. Before and after the sampling period, the sampling equipment is kept clean and heated by backblowing of heated air. The sampling gas velocity is kept constant during the sampling period. The sampled pulverized fuel is separated in a high-efficiency cyclone.

3 Sampling

3.1 Sampling equipment

The sampling equipment consists of a sampler and auxiliary equipment which shall ensure proper taking, separation and collection of the samples.

3.1.1 Sampler

The sampler (see figure 1) is equipped with four sampling tips through which sample material can be simultaneously extracted. The tips are exchangeable, and if a tip is damaged, it shall be replaced.

By means of an angular gear mechanism with a gear ratio 2:1, the sampler tips can be rotated in concentric circles around the sampler head. A dial with eight equally distributed (45°) marks indicates the angular positions of the sampler tips at every 22,5°. When the dial is rotated twice, it gives one full turn of the sampler tips, thus giving 16 angular positions.

The radial positions of the four sampling tips will ensure sampling from equal areas of the cross-sectional area of the pipe (see figure 2). The use of equal time sampling, with the sampler set at the 16 indicated angular positions, thus results in a representative sample being extracted from a total of 64 equal-sized areas of the sampling plane of the pipe.