

**INTERNATIONAL
STANDARD**

**ISO/FDIS
20905**

First edition
2004-07-15

**Coal preparation — Determination of
dust/moisture relationship for coal**

*Préparation du charbon — Détermination de la relation
particules/humidité du charbon*

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Coal preparation — Determination of dust/moisture relationship for coal

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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.

~~International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.~~

~~The main task of technical committees is to prepare International Standards. 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.~~

~~Attention is drawn~~The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that ~~some of the elements~~implementation of this document may ~~involve~~ the ~~subject~~use of (a) patent(s). ISO takes ~~no position concerning the evidence, validity or applicability of any claimed patent rights, in respect thereof.~~ As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 20905~~Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.~~

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 27, *Coal and Coke*, Subcommittee SC 1, *Coal preparation: Terminology and performance*.

This second ~~draft edition cancels and~~ replaces the first ~~draft edition (ISO 20905:2004 and is), of which it constitutes~~ a minor revision.

~~Comments received did not contain any technical~~The changes but rather dealt with changing compared to the name of previous edition are as follows:

~~— the title away of ISO/TC 27 was changed from "Solid Mineral Fuels/mineral fuels" to just "Coal. Some changes of";~~

~~— some terminology, relating was changed to align with ISO rules—on using, for example the words "Percentage" terms "percentage", "weight" and "Weigh," weighing" commonly used in";~~

Any feedback or questions on this document should be directed to the industry user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The development of the dust/moisture curve provides an indication of the likely response of different coal types to drying or water addition during mining and handling processes. The dust/moisture curve provides a good basis for comparing the response of different coal types. Understanding the dust/moisture characteristics of a coal ~~will allow~~allows minimized water addition to the product for dust suppression. This ~~will~~ in turn ~~assist~~assists in water conservation at mines and other handling facilities, as well as minimizing the total moisture of the product.

This ~~International Standard document~~ describes a reliable measurement of dustiness of coal and extends to cover the relationship between dust and total moisture utilizing the Rio Tinto Dust Tumbler Test. This test provides a quantitative measure of the dustiness of a coal that can be used to predict operational dust problems and is also suitable for the assessment of dust suppression chemicals.

The Rio Tinto Dust Tumbler Test was developed using rotating equipment in a controlled temperature and humidity environment and uses a stream of air to remove particles which become airborne during the tumbling process. It is a batch test in which dust particles (~~1~~150 µm particles) are collected in a filter bag of known mass and their mass is determined. From this mass, a dust number, calculated as the mass yield of dust multiplied by 100 000, is determined for the test total moisture. Only 1 kg of sample is required for each dust test, but eight sample lots are required to develop the dust/moisture curve for a particular coal, i.e. approximately 10 kg is required for each coal type.

This dust test can be repeated with subsamples at different coal total moisture levels to develop a dust/moisture curve. The slope of the curve provides information on how sensitive the dustiness is to changes in total moisture and a dust number of 10 has been used to provide a comparison between coals.

The test has been successfully used for several years on many coals and other bulk materials. The results have been correlated with the operating practice. The method has been applied to the evaluation of dust-control products, and the determination of dust-elimination total moisture requirements for coal-handling systems.

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1 Scope

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Coal preparation — Determination of dust/moisture relationship for coal

1 Scope

This ~~International Standard document~~ sets out a laboratory procedure for the dust testing of higher rank coals. The procedure defines a means of evaluating the dust/moisture relationship characteristic of a coal and a dust extinction moisture (DEM).

NOTE In this ~~standard document~~, an experimental dust number of 10 has been used in the example given in ~~Annex A Annex A~~.

2 Normative references

The following ~~referenced~~ documents are ~~indispensable for referred to in the application text in such a way that some or all of their content constitutes requirements~~ of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 589, Hard coal.— Determination of total moisture

~~ISO 1953, Hard coal — Size analysis by sieving~~

ISO 7886-1, Sterile hypodermic syringes for single use.— Part 1: Syringes for manual use

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

~~ISO and IEC maintain terminology databases for use in standardization at the following addresses:~~

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1

dust

particles of 150 µm or less diameter entrained in an air stream

3.2

dust extinction moisture

DEM

total moisture at which a dust number of 10 is attained on the dust/moisture curve

NOTE — ~~Note 1 to entry~~: DEM is a useful point for comparing different coals and the effectiveness of reagents.

Deleted Cells

4 Safety

The following safety precautions shall be observed:-

- To prevent nitrogen build-up within the laboratory, the exhaust tube of the minimum-free-space oven shall remain clear of obstruction.
- Safety glasses shall be worn at all times.
- The exhaust tube of the minimum-head-space oven shall remain free of obstruction to prevent nitrogen build-up within the laboratory.
- A dust mask shall be worn when handling coal.
- Cloth or leather gloves shall be worn when using ovens.
- The hazards associated with a reagent shall be determined prior to use. Instructions on all relevant [Material Safety Data Sheets \(MSDS\)](#) [material safety data sheets](#) shall be followed.

5 Apparatus and equipment

The following apparatus and equipment is required.

5.1 Humidity- and temperature-controlled laboratory, with relative humidity of $63\% \pm 2\%$ and temperature of $20\% \pm 2\% \pm 2\text{ }^{\circ}\text{C}$.

5.2 Dust-test apparatus, ~~having~~with a rotating drum of 30 cm diameter and 30 cm effective length, as shown in ~~Figure 1~~ [Figure 1](#). The required drum speed is 29 r/min, and the desired airflow through the drum is 175 L/min.

5.3 Double filter bags, single use only.

5.4 Electronic thermohydrograph.

5.5 Tachometer.

5.6 Laminar flow differential-pressure manometer.

5.7 Stopwatch.

5.8 Capped bottles, of capacity 250 mL, wide mouth, polypropylene.

5.9 Top loading balance, ~~having~~which has a minimum capacity of 1 g and ~~is~~ readable to the nearest 0,01 g.

5.10 Laboratory trays.

5.11 Minimum-free-space drying oven.

6 Reagent

Tap water is used in solution and sample preparation.