International Standard

ISO 20905

Coal preparation — Determination of dust/moisture relationship for coal

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

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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.

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).

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

This second edition cancels and replaces the first edition (ISO 20905:2004), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

— the title of ISO/TC 27 was changed from "Solid mineral fuels" to "Coal";

— some terminology was changed to align with ISO rules, for example the terms "percentage", "weight" and "weighing".

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

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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 allows minimized water addition to the product for dust suppression. This in turn assists in water conservation at mines and other handling facilities, as well as minimizing the total moisture of the product.

This 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 (–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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Coal preparation — Determination of dust/moisture relationship for coal

1 Scope

This 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 document, an experimental dust number of 10 has been used in the example given in Annex A.

2 Normative references

The following documents are referred to in the 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 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 size 150 µm or less 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 1 to entry: DEM is a useful point for comparing different coals and the effectiveness of reagents.

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.

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