INTERNATIONAL STANDARD

ISO 502

Third edition
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Coal — Determination of caking power — Gray-King coke test

Charbon — Détermination du pouvoir agglutinant — Essai Gray-King

Reference number
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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 27, *Solid mineral fuels*, Subcommittee SC 05, *Methods of analysis*.

This third edition cancels and replaces the second edition (ISO 502:1982), which has been technically revised.

Introduction

The purpose of the Gray-King coke test, which is one of the parameters adopted for the International Classification of Hard Coal by Type by the United Nations Economic Commission for Europe, is to assess the caking properties of a type of coal or a blend of coals by carbonizing under standard conditions.

Although the Gray-King test and the Roga test both assess the caking properties of a coal, they do not measure precisely the same parameters and are not recommended to be regarded as alternative methods.

Coal — Determination of caking power — Gray-King coke test

1 Scope

This International Standard specifies a method of assessing the caking power of coal under standard conditions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1014, *Coke — Determination of true relative density, apparent relative density and porosity*

3 Principle

The sample is heated under standard conditions to a final temperature of 600 °C. The coke residue obtained is classified by reference to a series of standard residues. If the coke residue produced is so swollen that it fills the cross-section of the retort tube, the determination is repeated with the coal admixed with a suitable quantity of electrode carbon or equivalent material. For these highly swelling coals, the Gray-King coke type is defined by the minimum amount of electrode carbon required to produce a strong hard coke residue of the same volume as the original coal and electrode carbon mixture.

4 Reagent

4.1 Standard electrode carbon (see 10.1)

High temperature electrode carbon:

Moisture	less than 1 %
Volatile matter	less than 1,5 %
Ash	less than 5 %
Bulk density at 25 °C (see Annex A)	1,00 g/cm^3 to 1,05 g/cm^3
Relative density at 25 °C (see 10.2)	2,05 to 2,09

Size analysis:

Retained on 212 µm test sieve	nil
Through 212 µm test sieve, retained on 125 µm test sieve	less than 26 %
Through 125 µm test sieve, retained on 63 µm test sieve	10 % to 40 %
Through 63 µm test sieve	50 % to 85 %