AS 1038.20—2002
ISO 5074:1994

Australian Standard™

Coal and coke—Analysis and testing

Part 20: Higher rank coal—Hardgrove grindability index

[ISO title: Hard coal—Determination of Hardgrove grindability index]

Standards Australia

This Australian Standard was prepared by Committee MN-001, Coal and Coke. It was approved on behalf of the Council of Standards Australia on 14 June 2002 and published on 4 July 2002.

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Australian Coal Association

Australian Coal Preparation Society

Australian Institute of Energy

Coalfield Geology Council of New South Wales

CSIRO, Division of Energy Technology

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Australian Standard™

Coal and coke—Analysis and testing

Part 20: Higher rank coal—Hardgrove grindability index

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PREFACE

This Standard was prepared by the Standards Australia Committee MN-001, Coal and Coke, to supersede AS 1038.20—1992, *Coal and coke—Analysis and testing*, Part 20: *Higher rank coal—Hardgrove grindability index.*

The objective of this Standard is to provide an empirical ranking of the relative grindability or ease of pulverization of a coal under standardized conditions.

This Standard is identical with and has been reproduced from ISO 5074:1994, *Hard coal—Determination of hardgrove grindability index.*

Some coals of higher air-dry moisture content can give different results at different moisture levels. Therefore the repeatability and reproducibility cited in this test method may not apply for these coals, and it is recommended that the air-dry moisture content of a subsample of the test portion be determined and reported.

As this Standard is reproduced from an international Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
ISO		AS	
1988	Hard coal—Sampling	4264	Coal and coke—Sampling
		4264.1	Part 1: Higher rank coal—Sampling procedures
3310	Test sieves—Technical requirements and testing	1152	Specification for test sieves
3310-1	Part 1: Test sieves of metal wire cloth		

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annexes to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.

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INTRODUCTION

The Hardgrove grindability test and test machinery are designed and developed to characterize the relative grindability of coals. The Hardgrove grindability index represents a composite physico-mechanical property of the coal, embracing a number of specific properties such as hardness, strength, tenacity and fracture, and is a function primarily of coal rank and secondarily of coal type. Two of the important variables that can influence the result of this determination are the method of sample preparation which involves selective grinding of the coal, and the moisture content of the coal. The Hardgrove grindability index is used empirically to estimate the capacity and power consumption of a pulverizer, given a specified product fineness.

AUSTRALIAN STANDARD

Coal and coke—Analysis and testing

Part 20:
Higher rank coal—Hardgrove grindability index

1 Scope

This International Standard specifies the method for determining the grindability index of hard coal[1)] using the Hardgrove machine. It also specifies the procedure for calibrating the test machine and for preparing the standard reference coal samples.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1988:1975, *Hard coal — Sampling*

ISO 3310-1:1990, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth.*

3 Definitions

For the purposes of this International Standard, the following definition applies.

3.1 hard coal: Coal having a gross calorific value of more than 24 MJ/kg on a moist, ash-free basis.

4 Principle

Treatment of a prepared sample of coal of limited size range under defined conditions in laboratory apparatus of standardized design (calibrated Hardgrove machine). Derivation of the grindability index from sieve analysis of the ground product and by reference to a calibration chart prepared from standard reference material.

5 Apparatus

5.1 Balance, capable of weighing up to 100 g to an accuracy of 0,01 g.

5.2 Balance, capable of weighing up to 1 500 g to an accuracy of 1 g.

5.3 Sample divider, as specified in A.6.3 of ISO 1988:1975.

5.4 Crusher, a laboratory crusher capable of reducing 4,75 mm coal particles to 1,2 mm with the production of a minimum of material finer than 600 µm. In the case of a plate mill, the plates shall be serrated and about 100 mm in diameter, the distance between the plates being adjustable and the relative frequency of rotation of the plates not exceeding 200 min^{-1}. Roll mills or hammer mills shall not be used.

5.5 Sieves

5.5.1 Wire-cloth test sieves, complying with the requirements of ISO 3310-1, Series R 40/3, of aperture sizes 1,18 mm, 600 µm and 75 µm respectively, and having a cover and receiver of diameter about 200 mm.

1) In this International Standard, the term "hard coal" is used as an indication of maturity or rank in the coalification sequence and is not related to the physical properties of the coal.