Australian Standard™

Coal and coke—Analysis and testing

Part 19: Higher rank coal—Abrasion index

[ISO title: Hard coal—Determination of abrasiveness]

Standards Australia

This Australian Standard was prepared by Committee MN/1, Coal and Coke. It was approved on behalf of the Council of Standards Australia on 15 September 2000 and published on 20 October 2000.

The following interests are represented on Committee MN/1:

Australasian Institute of Mining and Metallurgy

Australian Coal Association

Australian Coal Preparation Society

Australian Institute of Energy

Bureau of Steel Manufacturers of Australia

Coalfield Geology Council of N.S.W.

CSIRO, Energy Technology

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PREFACE

This Standard was prepared by the Standards Australia Committee MN/1, Coal and Coke, to supersede AS 1038.19—1989, *Coal and coke—Analysis and* testing, Part 19: *Determination of the abrasion index for higher rank coal*.

The objective of this Standard is to provide drilling contractors and manufacturers of conveying and coal handling equipment with a method for determining the abrasiveness of coal.

This Standard is identical with and has been reproduced from ISO 12900:1997, *Hard coal—Determination of abrasiveness.*

Statements expressed in mandatory terms in notes to text, tables and figures are deemed to be requirements of this Standard.

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	
589	Hard coal—Determination of total moisture	1038 1038.1	Coal and coke—Analysis and testing Part 1: Higher rank coal—Total moisture
1988	Hard coal—Sampling	4264 4264.1	Coal and coke—Sampling Part 1: Higher rank coal—Sampling procedures
3310 3310-1	Test sieves—Technical requirements and testing Part 1: Test sieves of metal wire cloth	1152	Specification for test sieves
6507 6507-1	Metallic materials—Vickers hardness test Part 1: Test method	1817	Metallic materials—Vickers hardness test
9411 9411-1	Solid mineral fuels—Mechanical sampling from moving streams Part 1: Coal	4264 4264.1	Coal and coke—Sampling Part 1: Higher rank coal—Sampling procedures

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

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INTRODUCTION

The abrasiveness of coal is recognized as a factor in coal operations, from mining to utilization, requiring a standard method of measurement and evaluation, as some coals are more abrasive than others.

The interaction between coal and conveying, storage and crushing equipment results in component wear. In particular, the higher contact pressures in some coal pulverizers result in significant wear.

For the ranking or relative comparison of the abrasiveness of coals, a test was developed [1] which standardized the following equipment variables:

a) test equipment dimensions and tolerances;
b) speed of rotation of wearing components;
c) properties of the wearing components;
d) mass of the test portion;
e) top particle size of the test portion;
f) duration of the test.

The abrasiveness of coal is generally a function of two factors: the physical properties of the coal, in particular moisture content, mineral content and mineral characteristics [1], [2], [3], [4], [5], [6]; the mechanics of the operations to which the coal is subjected.

NOTE — Moisture contents over 10 % in the test sample after air-drying and laboratory equilibration may give anomalous results; the reason for this has not been established.

Wear on coal-pulverizing elements in industrial mills is influenced by the physical characteristics of the coal and its mineral constituents, the mechanical characteristics of the mill, including the milling pressures, alloy material properties and coal feed flow, and the operation of the mill. Abrasiveness as determined by this International Standard has been demonstrated to provide initial empirical estimates of specific wear rates in certain types of industrial tube-ball mills, vertical spindle mills and high-speed hammer mills [3], [6], with different coefficients for each mill type.

Abrasiveness as determined by this International Standard may be of value in providing an initial estimate of the likely wear in other applications, giving the relative effect of different coals.

AUSTRALIAN STANDARD

Coal and coke—Analysis and testing

Part 19:
Higher rank coal—Abrasion index

1 Scope

This International Standard describes a method for determining the abrasiveness of hard coal.

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 589:1981, *Hard coal — Determination of total moisture*.

ISO 1988:1975, *Hard coal — Sampling*.

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

ISO 6507-1:1997, *Metallic materials — Vickers hardness test — Part 1: Test method*.

ISO 9411-1:1994[1)], *Solid mineral fuels — Mechanical sampling from moving streams — Part 1: Coal.*

3 Principle

Four standard steel blades are rotated under specified conditions in a 2 kg mass of prepared coal in a test machine. The abrasiveness is calculated from the mass of steel lost during the test.

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1) To be revised as ISO 13909.