AS 4156.2.1—2004
ISO 8858-1:1990 and
ISO 8858-1:1990/Cor.1:2001

AS 4156.2.1—2004

Australian Standard™

Coal preparation

Part 2.1: Higher rank coal—Froth flotation—Basic test

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 1 July 2004.
This Standard was published on 13 August 2004.

The following are represented on Committee MN-001:

Australasian Institute of Mining and Metallurgy
Australian Building Codes Board
Australian Coal Association
Australian Coal Preparation Society
Australian Institute of Energy
Coalfield Geology Council of NSW
CSIRO Energy Technology
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This Standard was issued in draft form for comment as DR 04238.

Australian Standard™

Coal preparation

Part 2.1: Higher rank coal—Froth flotation—Basic test

Originally as AS 2579.1—1983.
Previous edition AS 4156.2.1—1994.
Second edition 2004.

Published by Standards Australia International Ltd GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 6186 0

PREFACE

This Standard was prepared by the Standards Australia Committee MN-001, Coal and Coke, to supersede AS 4156.2.1—1994, *Coal preparation,* Part 2.1: *Higher rank coal—Froth flotation—Basic test.*

The objective of this Standard is to provide the coal preparation industry with a basic procedure for the froth flotation testing of fine coal which provides a means of evaluating the flotation characteristics of a coal.

The objective of this revision is to make the Australian Standard completely identical with the International Standard.

This Standard is identical with and has been reproduced from ISO 8858-1:1990, *Hard coal—Froth flotation testing,* Part 1: *Laboratory procedure* and its Corrigendum 1 (2001). The Corrigendum has been attached at the end of the document. It lists editorial corrections to the Scope and Figure 3.

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.

(c) In the source text, 'this part of ISO 8858' should read 'this Australian Standard'.

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

Reference to International Standard		*Australian Standard*	
ISO		AS	
331	Coal—Determination of moisture in the analysis sample—Direct gravimetric method	1038 1038.3	Coal and coke—Analysis and testing Part 3: Proximate analysis of higher rank coal
565	Test sieves—Metal wire cloth, perforated metal plate and electroformed sheet—Nominal sizes of openings	1152	Specification for test sieves
648	Laboratory glassware—One-mark pipettes	2166	Laboratory glassware—One-mark pipettes
1171	Solid mineral fuels—Determination of ash	1038 1038.3	Coal and coke—Analysis and testing Part 3: Proximate analysis of higher rank coal
1213 1213.1	Solid mineral fuels—Vocabulary Part 1: Terms relating to coal preparation	2418	Coal and coke—Glossary of terms
1953	Hard coals—Size analysis	3881	Higher rank coal—Size analysis
1988	Hard coal—Sampling	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.

CONTENTS

INTRODUCTION

The froth flotation of coal has widespread application for the concentration and separation of fine coal particles from mineral matter. The response of coal to the froth flotation process is initially measured by a laboratory scale test. Although the principles used for the laboratory tests are generally similar, the precise type of equipment and techniques used vary considerably.

The procedure for the laboratory froth flotation test sets out, in detail, the type of equipment to be used and the methods to be adopted. The purpose of this procedure is to provide a standard method of test by which a preliminary evaluation of the froth flotation characteristics of a coal can be compared. This need is particularly important for exploration programmes. This part of ISO 8858 also serves as an introduction for operators who are not familiar with the techniques (and problems) associated with the laboratory froth flotation of coals.

AUSTRALIAN STANDARD

Coal preparation

Part 2.1:
Higher rank coal—Froth flotation—Basic test

1 Scope

This part of ISO 8858 sets out a laboratory procedure for the froth flotation testing of fine coal, e.g. coal of particle size less than 0,5 mm. The procedure provides a means of evaluationg the general flotation characteristics of a coal under a set of specified standard conditions and will not necessarily indicate the full flotation potential of that coal.

The flotation characteristics of coals are sensitive to changes in flotation conditions. These conditions can be changed by varying such basic parameters as flotation time, reagent and dosage rate. Separate flotation tests are required to assess the effect of varying these parameters to determine the best flotation conditions for a particular coal. A method of evaluating flotation response will be given in a separate standard.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8858. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8858 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 331:1983, *Coal — Determination of moisture in the analysis sample — Direct gravimetric method.*

ISO 565:1990, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings.*

ISO 648:1977, *Laboratory glassware — One-mark pipettes.*

ISO 1171:1981, *Solid mineral fuels — Determination of ash.*

ISO 1213-1:1982, *Solid mineral fuels — Vocabulary Part 1: Terms relating to coal preparation.*

ISO 1953:1972, *Hard coals — Size analysis.*

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

3 Definitions

For the purposes of this part of ISO 8858, the definitions in ISO 1213-1 apply. The following definitions from ISO 1213-1 are repeated for information only.

3.1 collector; collecting agent: A reagent added to a pulp to bring about adhesion between solid particles and air bubbles.

3.2 flotation concentrate: The clean product recovered in froth flotation.

3.3 conditioning: The preparatory stage in the flotation process in which the reagents are brought into intimate contact with the solids of the pulp.

3.4 frother; frothing agent: A reagent used to control the size and stability of the air bubbles in the flotation process.

3.5 froth flotation: A process for cleaning fine coal in which the coal, with the aid of a reagent or reagents, becomes attached to air bubbles in a liquid medium and floats as a froth.

3.6 pulp: A mixture of solid particles and water.