Australian Standard™

Higher rank coal and coke—Bulk density

Standards Australia

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Australian Coal Association

Australian Coal Preparation Society

Australian Institute of Energy

Coalfield Geology Council of N.S.W.

CSIRO Energy Technology

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PREFACE

This Standard was prepared by the Standards Australia Subcommittee MN-001-04, *Coal Sampling*, for Committee MN-001, *Coal and Coke*, as a revision of AS 3899—1991, *Higher rank coal and coke—Bulk density*.

The hopper-filled box method for the determination of bulk density of higher rank coal has been deleted from this edition.

Reference to ASTM D291, *Standard Test Method for Cubic Foot Weight of Crushed Bituminous Coal* should be made if a determination of bulk density by the hopper-filled box method is required.

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FOREWORD

The bulk density of coal and coke depends upon its physical characteristics, i.e. relative density and shape of particles, the dimensions of the container, the size distribution of the coal particles and their moisture content. Size analysis is important and it is therefore recommended that a separate size analysis be determined in accordance with AS 3881, *Higher rank coal—Size analysis*.

Results for bulk density will change according to variations in the above characteristics. In practice, results can be considered under two main headings:

(a) *As poured (uncompacted)*—the bulk density that results from pouring the material into a heap or container in the absence of compacting forces.

(b) *Aerated**—the bulk density created when particles are separated from each other by an air film. (Applies only to fine, dry powders.)

In any bulk density measurement, the test conditions should simulate or represent, as closely as possible, the actual conditions under which the bulk density needs to be known, as the method used will influence the result†. The method used to determine bulk density has to be specified in the test report.

* A brief description of this procedure is given in *Bulk solids physical properties test guide*, British Materials Handling Board, 1983

† CSIRO Report TC 19, *The control of bulk density by moisture and oil addition*, August 1957.

STANDARDS AUSTRALIA

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1 SCOPE

This Standard sets out the following three methods for the determination of the bulk density of crushed higher rank coal and coke:

(a) Uncompacted box method, for coal less than 45 mm nominal top size (see Note to Clause 4.2.3(a)).

(b) Measuring cylinder method, for coal typically less than 63 µm as used in pulverized fuel fired boilers and cement kilns.

(c) Uncompacted box method for coke.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS	
1038	Coal and coke—Analysis and testing
1038.1	Part 1: Higher rank coal—Total moisture
1038.2	Part 2: Coke—Total moisture
2418	Coal and coke—Glossary of terms
2706	Numerical values—Rounding and interpretation of limiting values
4264	Coal and coke—Sampling
4264.1	Part 1: Higher rank coal—Sampling procedures
4264.2	Part 2: Coke—Sampling procedures
ISO	
567	Coke—Determination of bulk density in a small container

3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS 2418 and those below apply.

3.1 Bulk density of higher rank coal

The mass of a unit volume of higher rank coal, including the voids within and between the particles, measured under standard conditions.

3.2 Bulk density of coke

The mass per unit volume of dry coke, as determined in a standard container using a standardized procedure.

4 DETERMINATION OF BULK DENSITY OF HIGHER RANK COAL

4.1 General

Samples containing fines will show significant variations in bulk density with variations in moisture. Care should be taken to ensure that moisture in the test sample is representative of the gross sample.