Australian Standard®

Coal and coke — Analysis and testing

Part 1: Higher rank coal — Total moisture

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Australasian Institute of Mining and Metallurgy
Australian Coal Association
Australian Coal Industry Research Laboratories
Australian Coal Preparation Society
Australian Institute of Energy
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
CSIRO, Division of Coal and Energy Technology
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PREFACE

This Standard was prepared by the Standards Australia Subcommittee on Coal Evaluation, under the supervision of the Committee on Coal and Coke, as a revision of AS 1038.1–1980, *Methods for the analysis and testing of coal and coke*, Part 1: *Total moisture in hard coal*.

The Standard contains a method for determination of free moisture and three methods for the determination of the residual moisture content of higher rank coal, viz. direct volumetric method (Method A), drying in nitrogen (Method B), and drying in air (Method C).

Basically, there is little difference between the methods specified in the 1980 edition and those in this revised edition. However, the 1980 edition specified a maximum particle size of 3 mm for Methods A and B and a maximum of approximately 20 mm for Method C. Maximum particle sizes specified in this Standard are 4 mm for Methods A and B and 11.2 mm for Method C. These sizes conform with recognized international sieve apertures.

This Standard is not technically equivalent to ISO 589:1981, *Hard coal – Determination of total moisture.*

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Part 1: Higher rank coal – Total moisture

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out methods for the determination of total moisture, free moisture and residual moisture in higher rank coal. The methods are as follows:

(a) Drying in air, for free moisture.
(b) Distillation (Method A), for residual moisture.
(c) Drying in nitrogen (Method B), for residual moisture.
(d) Drying in air (Method C), for residual moisture.

Methods A and B are applicable to all higher rank coals. Method C is applicable only to higher rank coals that are known not to be susceptible to significant oxidation.

Where the sample is visibly wet, determination of residual moisture by Method A, B or C is generally preceded by the determination of free moisture, unless the sample is suitable for the direct determination of total moisture using Method C.

1.2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS
1038 Methods for the analysis and testing of coal and coke
1038.16 Part 16: Acceptance and reporting of results
2096 Classification and coding systems for Australian coals
2243 Safety in laboratories
2508 Safe storage and handling information cards for hazardous materials
2646 Sampling of solid mineral fuels
2706 Numerical values – Rounding and interpretation of limiting values

1.3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

1.3.1 Higher rank coal (as defined in AS 2096) – coal having a gross specific energy of 21 MJ/kg or greater on an ash-free, moist basis *and* a gross specific energy of 27 MJ/kg or greater on a dry, ash-free basis.

1.3.2 Total moisture – the moisture in the coal as sampled or as received (M_{as}).

1.3.3 Free moisture – the moisture that is lost by the coal sample in attaining equilibrium with the air to which it is exposed (M_f).

1.3.4 Moisture in the air-dry sample (residual moisture) – the moisture remaining (subject to ambient conditions) in the coal sample after it has attained equilibrium with the air to which it is exposed (M_r).

1.3.5 Gross sample – a sample formed when all the increments collected from a lot or sampling unit are combined for reduction to a laboratory sample.

1.3.6 Common sample – a gross sample from which the laboratory samples for total moisture and for general analysis are prepared.

1.3.7 Moisture sample – a sample to be used exclusively for the determination of total moisture.

1.4 SAFETY For information on laboratory safety, reference should be made to the relevant parts of AS 2243 and AS 2508.

1.5 SAMPLES

1.5.1 General Sampling and sample preparation procedures for total moisture determination are described in AS 2646.

NOTE: The preferred sampling scheme for determination of total moisture is presented in Appendix A.

1.5.2 Types of samples to be tested The sample to be tested will be either –

(a) a common sample; or
(b) a moisture sample.

The procedure for extraction of a moisture sample from the bulk sample is described in AS 2646.