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# Australian Standard 1038, Part 1—1980

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**METHODS FOR THE ANALYSIS  
AND TESTING OF COAL AND COKE  
Part 1—TOTAL MOISTURE  
IN HARD COAL**



**STANDARDS ASSOCIATION OF AUSTRALIA**

*Incorporated by Royal Charter*



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THE FOLLOWING INDUSTRIAL, SCIENTIFIC AND GOVERNMENTAL organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Coal Association  
Australian Institute of Energy  
Australasian Institute of Mining and Metallurgy  
Bureau of Steel Manufacturers of Australia  
Coal Preparation Societies of N.S.W. and Queensland  
Confederation of Australian Industry  
Department of Minerals and Energy, Victoria  
Department of Mineral Resources, N.S.W.  
Department of National Development  
Electricity Supply Association of Australia  
Institution of Engineers, Australia  
Joint Coal Board  
Queensland Coal Board  
Royal Australian Chemical Institute  
Universities

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This standard, prepared under the direction of Committee CH/15, Coal and Coke, was approved by the Chemical Standards Board on behalf of the Council of the Standards Association of Australia on 11 March 1980, and was published on 1 June 1980.

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**AUSTRALIAN STANDARD**

**METHODS FOR THE  
ANALYSIS AND TESTING OF  
COAL AND COKE**

**Part 1  
TOTAL MOISTURE IN  
HARD COAL**

**AS 1038, Part 1—1980**

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## PREFACE

This standard was prepared by the Association's Committee on Coal and Coke under the direction of the Chemical Standards Board. It replaces AS K152, Part 1—1965 which was the endorsement of BS 1016:Part 1:1957, but which was withdrawn when BS 1016:Part 1:1957 was revised in 1973.

This standard is based on, and is technically identical with ISO 581—Hard Coal—Determination of Total Moisture. Basically there is little difference between the methods specified in the 1965 edition and those in this revised edition. However the 1965 edition specified separate methods for coal of ½ inch and 6 BS mesh size whereas the methods specified herein are applicable to coals of 3 mm maximum particle size except for the method of drying in air which used coals with a maximum particle size of about 20 mm.

The standard contains three methods for the determination of the total moisture content of hard coal, viz direct volumetric method, drying in nitrogen, and drying in air. It requires reference to the following Australian standard:

AS 1676 Methods for the Sampling of Hard Coal

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## STANDARDS ASSOCIATION OF AUSTRALIA

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**Australian Standard**  
**METHODS FOR THE ANALYSIS AND TESTING OF**  
**COAL AND COKE**

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**PART 1—TOTAL MOISTURE IN HARD COAL**

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**1 SCOPE.** This standard sets out three methods for the determination of the total moisture content of hard coal. The methods are as follows:

- (a) Direct Volumetric Method (Method A).
- (b) Drying in Nitrogen (Method B).
- (c) Drying in Air (Method C).

**2 APPLICATION.** Methods A and B are applicable to all hard coals. Method C is applicable only to hard coals which are known not to be susceptible to significant oxidation.

**3 DEFINITIONS.** For the purpose of this standard, the following definitions apply:

**3.1 Total moisture**—total moisture in the coal as sampled.

**3.2 Free moisture**—the moisture which is lost by the coal sample in attaining equilibrium with the air to which it is exposed.

**3.3 Moisture in air-dried coal**—the moisture in the coal sample after it has attained equilibrium with the air to which it is exposed.

**4 PRINCIPLE.**

**4.1 Method A (Applicable to all hard coals).** The sample is heated in a flask under reflux conditions with boiling toluene. The moisture from the coal is entrained by the toluene vapour and carried to a condenser fitted with a graduated receiver. The water then separates in the receiver, to form the lower layer, while the excess toluene is returned to the distillation flask by means of an overflow. The moisture in the coal is calculated from the mass of the sample and the volume of water collected.

**4.2 Method B (Applicable to all hard coals).** The sample is heated in an oven at a temperature of 105°C to 110°C in a current of nitrogen and the moisture calculated from the loss in mass.