1038 Methods for the analysis and testing of coal and coke

Part 5.1—1988 Gross specific energy of coal and coke—Adiabatic calorimeters A4 9pp C

(In Update Service 32)

Sets out a method for the determination of the gross specific energy at constant volume of coal or coke, using a bomb calorimeter with an adiabatic water jacket. Precision data and a method for determination of the mean effective heat capacity of the calorimeter are provided.

Committee MN/1: Supersedes AS 1038.5—1979 (in part): Draft for comment DR 86213: Publication date 1988-06-17: ISBN 0 7262 5110 0.

Part 5.2—1989 Gross specific energy of coal and coke—Automatic isothermal-type calorimeters A4 5pp C

(In Update Services 32)

Sets out a method for the determination of the gross specific energy of coal or coke using bomb calorimeters of the automatic isothermal type.

Committee MN/1: Supersedes AS 1038.5—1979: Draft for comment DR 88103: Publication date 1989-11: ISBN 0 7262 5620 X.

AS 1038, Part 5—1979
UDC [662.66 + 662.74]:536.662

Australian Standard 1038, Part 5—1979

METHODS FOR THE ANALYSIS AND TESTING OF COAL AND COKE

Part 5—GROSS SPECIFIC ENERGY OF COAL AND COKE

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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 and Development

Department of National Development

Electricity Supply Association of Australia

Institution of Engineers, Australia

Joint Coal Board

Queensland Coal Board

Royal Australian Chemical Institute

Universities

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 12 April 1979, and was published on 1 September 1979.

To enable it to keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvement to published standard, addressed to the head office of the Association, are welcomed.

This standard was issued in draft form for public review as DR 78074.

AUSTRALIAN STANDARD

METHODS FOR THE ANALYSIS AND TESTING OF COAL AND COKE

Part 5
GROSS SPECIFIC ENERGY OF COAL AND COKE

AS 1038, Part 5—1979

First published (as AS K152, Part 5) 1965
Revised 1969
Revised and issued as AS 1038, Part 5 ... 1979

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.

ISBN 0 7262 1702 6

PREFACE

This standard was prepared by the Association's Committee on Coal and Coke under the direction of the Chemical Standards Board, as a revision of AS K152, Part 5—1969, which has been withdrawn. AS K152, Part 5 was the endorsement of BS 1016, Part 5—1967, which was subsequently superseded by Part 5—1977.

The method is based closely on ISO 1928, Solid Mineral Fuels—Determination of Gross Calorific Value by the Calorimetric Bomb Method, and Calculation of Net Calorific Value. It differs from ISO 1928 in that it does not make provision for the calculation of the net specific energy of the coal.

This standard requires reference to the following Australian and British standards:

AS 1038	Methods for the Analysis and Testing of Coal and Coke Part 6—Ultimate Analysis of Coal Part 7—Ultimate Analysis of Coke Part 16—Reporting of Results
AS 1152	Test Sieves
AS 1349	Bourdon Tube Pressure and Vacuum Gauges
AS 1676	Methods for the Sampling of Hard Coal
AS 1898	Methods for the Sampling of Coke
BS 791	Bomb Calorimeter Thermometers
BS 4791	Construction and Use of Calorimeter (Combustion) Bombs

The British standard, BS 1826—Definitions of the Calorific Values of Fuels, will also provide useful information for those intending to use this method.

In course of preparation as a revision of AS K152, Part 7.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

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

PART 5—GROSS SPECIFIC ENERGY OF COAL AND COKE

1 SCOPE. This standard describes methods for the determination of the gross specific energy, at constant volume, of coal or coke, using bomb calorimeters with either adiabatic, isothermal or [illegible] water jackets, or polystyrene jackets.

NOTES:

1. For the calculation of results to bases other than as analysed, reference should be made to Part 16 of this standard.
2. The methods of calculating from the gross specific energy determined at constant volume, to gross specific energy at constant pressure, net (or lower) specific energy at constant volume and net (or lower) specific energy at constant pressure, are also described in Part 16.

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

2.1 Unit of heat—the joule (J).

2.2 Unit of temperature—the kelvin (K).

NOTE: 1 K = a temperature interval of 1 degree Celsius (°C).

The international reference temperature for thermochemistry of 25°C is used as the reference temperature for specific energy, although the temperature dependence of the specific energy of coal or coke is small (about 1 J/g.K).

2.3 Gross specific energy at constant volume—the number of heat units liberated when unit mass of solid fuel is burned in oxygen in a bomb under standard conditions; the materials after combustion are taken to consist of the gases oxygen, carbon dioxide, sulphur dioxide, oxides of nitrogen and nitrogen, liquid water (in equilibrium with its vapour and saturated with carbon dioxide) and solid ash.

2.4 Effective heat capacity of the system—the heat required to cause unit rise of temperature in the calorimeter system under the conditions of a calorimetric determination.

2.5 Repeatability—the maximum acceptable difference between duplicate determinations carried out in the same laboratory on the same analysis sample.