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AS 1038 Coal and coke—Analysis and testing
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1038.21.2—1992 Lump sample
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Sets out two methods for the determination of the relative density of bulk samples of coal, and one method for coke.

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METHODS FOR THE ANALYSIS AND TESTING OF COAL AND COKE

Part 21—DETERMINATION OF THE RELATIVE DENSITY AND APPARENT RELATIVE DENSITY OF HARD COAL

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Bureau of Steel Manufacturers of Australia

Coal Preparation Societies of N.S.W. and Queensland

Confederation of Australian Industry

CSIRO, Division of Fossil Fuels

Department of Minerals and Energy, Victoria

Department of Mineral Resources, N.S.W.

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PREFACE

This standard was prepared by the Association's Committee on Coal and Coke under the direction of the Minerals Standards Committee.

The determination of the relative density of hard coal is being carried out using a number of different procedures. Consequently, it has been considered desirable that standard methods be prepared to enable interlaboratory comparisons to be made.

Two methods have been prepared for the determination of relative density and one for the determination of apparent relative density.

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STANDARDS ASSOCIATION OF AUSTRALIA

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

PART 21—DETERMINATION OF THE THE RELATIVE DENSITY AND APPARENT RELATIVE DENSITY OF HARD COAL

1 SCOPE. This standard sets out methods for the determination of the relative density and apparent relative density of air-dried hard coal.

Two methods are described for the determination of the relative density, viz:

(a) Density bottle method.

(b) Volumetric method.

One method is described for the determination of apparent relative density.

NOTE: If the apparent relative density is required for the coal on a bed-moist basis, the procedure described in Clause 5 may be used on the bed-moist coal.

2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1038	Methods for the Analysis and Testing of Coal and Coke Part 16—Reporting of Results
AS 1152	Test Sieves
AS 1676	Methods for the Sampling of Hard Coal
AS 2164	One-mark Volumetric Flasks
AS 2165	Burettes and Bulb Burettes
AS 2378	Density Bottles
BS 615	Kohlrausch Flasks

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

3.1 Relative density of hard coal—the ratio of the mass of a volume of a representative sample of air-dried coal, ground to pass a 212 μm aperture sieve, to the mass of an equal volume of water at the same ambient temperature.

3.2 Apparent relative density of hard coal—the ratio of the mass of a volume of lump coal to the mass of an equal volume of water (at a specified temperaure) inclusive of any voids within the lumps subjected to the test.

4 DETERMINATION OF RELATIVE DENSITY.

4.1 Density Bottle Method.

4.1.1 *Principle.* The mass of water displaced by a known mass of air-dried coal is determined in a density bottle.

4.1.2 *Sample.* The coal sample used for the determination shall be the analysis sample ground so that at least 99 percent passes a 212 μm test sieve complying with AS 1152, taken and prepared according to AS 1676. The sample shall be brought into equilibrium with the laboratory atmosphere by exposure in a thin layer on a tray.

4.1.3 *Apparatus.* The following apparatus is required:

(a) *Density bottle.* A density bottle of nominal 50 mL capacity conforming to AS 2378. Alternatively, the Castell-Evans modification (Fig. 1) has been found to be suitable. A stand to accommodate ten such bottles is shown in Fig. 2.

(b) *Water bath.* A water bath with stirrer, thermostatically controlled to maintain a bath temperature within $\pm$ 0.1°C. A convenient range of temperature is 25° C to 40° C. The temperature of the bath should be about 5°C above ambient temperature.

NOTE: The water temperature must be kept constant throughout both stages of the procedure described in Clauses 4.1.5 and 4.1.6. The actual temperature need not be reported with the result, as differences within this range are not significant.

(c) Micro funnel.

(d) Vacuum desiccator.

(e) Vacuum pump.