AS 3881—1991

Australian Standard®

Higher rank coal—Size analysis

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The following interests are represented on Committee MN/1:

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

Department of Minerals and Energy, N.S.W.

Department of Resource Industries, Qld

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Joint Coal Board

National Association of Testing Authorities, Australia

Queensland Coal Board

Royal Australian Chemical Institute

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PREFACE

This Standard was prepared by the Standards Australia Subcommittee on Coal Preparation, under the supervision of the Committee on Coal and Coke and the direction of the Minerals Standards Board. It describes sizing tests for higher rank coal.

During the preparation of this Standard, the following British and International Standards were considered: BS 1016, *Methods for the analysis and testing of coal and coke*, Part 17: *Size analysis of coal*, and ISO 1953, *Hard coals—Size analysis*.

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STANDARDS AUSTRALIA

Australian Standard
Higher rank coal—Size analysis

1 SCOPE This Standard sets out methods for the size analysis of higher rank coal (i.e. coal as defined in AS 2096 as 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).

Very fine coal (less than 45 μm) may be sized using microscopic, sedimentation or surface area measurement methods which are outside the scope of this Standard.

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

AS
1152 Test sieves

2096 Classification and coding systems for Australian coals

2418 Glossary of terms relating to solid mineral fuels

2646 Sampling of solid mineral fuels
2646.2 Part 2: Hard coal—Sampling from moving streams
2646.4 Part 4: Hard coal—Sampling from stationary situations
2646.6 Part 6: Hard coal—Preparation of samples

2706 Numerical values—Rounding and interpretation of limiting values

3 DEFINITIONS For the purpose of this Standard, the definitions given in AS 2418 apply.

4 APPARATUS

4.1 Test sieves—a series of test sieves of woven metal wire cloth, or perforated plate with square apertures, selected from those specified in AS 1152 and preferably from the following series:

125 mm, 90.0 mm, 63.0 mm, 45.0 mm, 31.5 mm, 22.4 mm, 16.0 mm, 11.2 mm, 8.00 mm, 5.60 mm, 4.00 mm, 2.80 mm, 2.00 mm, 1.40 mm, 1.00 mm, 710 μm, 500 μm, 355 μm, 250 μm, 180 μm, 125 μm, 90 μm, 63 μm, 45 μm.

4.2 Hardwood block—of approximate dimensions 150 mm × 10 mm × 10 mm.

4.3 Receivers and lids

4.4 Balance or weighing machine—capable of weighing to 0.05 percent of the initial mass of sample.

4.5 Trays—smooth trays, with dimensions complementary to sieve size; glazed paper is a suitable alternative if trays are not available.

4.6 Buchner funnel and flask

4.7 Filter paper

4.8 Oven—capable of being controlled at a temperature between 105°C and 110°C.

5 SAMPLING AND SAMPLE PREPARATION

5.1 Sampling The sample for size analysis should be taken in accordance with AS 2646.2 or AS 2646.4. Care should be taken during all stages of sampling, handling, transport and size analysis to ensure that breakage of coal and loss of coal dust are kept to a minimum.

5.2 Sample preparation

5.2.1 *General* The sample for size analysis should be prepared by the methods given in AS 2646.6.

5.2.2 *Sample drying* Where the coal is wet, the sample shall be dried sufficiently to prevent fine coal adhering to the larger particles during the sieving operation. Air-drying at ambient temperature is the recommended procedure to be adopted if other tests sensitive to oxidation of the coal are to be carried out. For coals containing more than 20 percent of wet fines under 2.8 mm, the sample should be spread in a thin layer and dried at a temperature not exceeding 40°C. The coal shall be allowed to equilibrate with the atmosphere before weighing.

5.2.3 *Sample division for reduction of bulk* Where the mass of undersize of a particular sieve is more than twice that given in Table 1, it may be reduced by sample division to not less than the figure given.

For samples having a nominal top size greater than 11.2 mm, where there is increased risk of breakage, sample division shall be by strip mixing and splitting or by fractional shovelling (see AS 2646.6). Where the top size is less than 11.2 mm, alternative division methods (e.g. riffling or mechanical sample division) may be used, provided that dust loss and size degradation are avoided.