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Australian Standard 2646.1—1984

SAMPLING OF SOLID MINERAL FUELS

Part 1—GUIDE TO THE USE OF PARTS 2 TO 8

STANDARDS ASSOCIATION OF AUSTRALIA
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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 Ltd

Australian Institute of Energy

Bureau of Steel Manufacturers of Australia

Coal Preparation Societies of New South Wales and Queensland

Confederation of Australian Industry

CSIRO, Division of Fossil Fuels

Department of Mineral Resources, N.S.W.

Department of Mines, Qld

Department of National Development

Electricity Supply Association of Australia

Institution of Engineers, Australia

Joint Coal Board

Queensland Coal Board

Royal Australian Chemical Institute

Standing Committee on Coalfield Geology, N.S.W.

State Chemistry Laboratory, Vic.

Universities

Representatives of the following interests also participated in the drafting of this standard:

Australian Coal Industry Research Laboratories Ltd, Maitland

Australian Iron and Steel Pty Ltd, Port Kembla

The Broken Hill Proprietary Co. Ltd, Central Research Laboratories

The Broken Hill Proprietary Co. Ltd, Newcastle

Cargo Superintendents Co. (A/Asia) Pty Ltd

Electricity Commission of New South Wales

Leveltec Engineering

SGS Australia Pty Ltd

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AUSTRALIAN STANDARD

SAMPLING OF SOLID MINERAL FUELS

Part 1— GUIDE TO THE USE OF PARTS 2 TO 8

AS 2646.1—1984

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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 Board as a guide to the use of AS 2646, Parts 2 to 8, which is a replacement for AS 1676—1975, Methods for the Sampling of Hard Coal, and AS 1898—1976, Methods for the Sampling of Coke. The work of revision was carried out as part of the Association's policy of updating the standards in the light of new technology.

It was agreed at an early stage of the review that the existing Australian standards (in common with other national and International standards) gave insufficient prominence to the methods of mechanical sampling and sampling from high capacity conveying systems which have rapidly and to a major extent replaced the traditional methods of sampling. Consequently considerable attention has been paid to this type of sampling during the revision.

During the revision it was found that there were a number of points of conflict between Australian standards and other standards concerning mass reduction of large primary increments prior to sample preparation which should be resolved. Subsequently it was agreed that the division of large increment or sample masses could be carried out prior to crushing.

The concept of a reference standard of precision, usually taken as one-tenth of the value of the principal quality characteristic to be determined, was eliminated in favour of a procedure for determining actual precision through an assessment of the coal or coke in terms of total variance, increment variance and sample preparation and testing variance at the commencement of any sampling scheme.

It was decided that the layout of the standards should be extensively reviewed and that procedures for the sampling and sample preparation of coal and coke should be included in a single standard. For ease of updating as needs arise, and in order to have a standard on the mechanical sampling of coal from moving streams available as soon as possible, it was agreed that the new standard would be published in a number of separate parts.

The parts of this standard are as follows:

Part 1 Guide to the Use of Parts 2 to 8
Part 2 Hard Coal—Sampling from Moving Streams
Part 3 Coke—Sampling from Moving Streams*
Part 4 Hard Coal—Sampling from Stationary Situations
Part 5 Coke—Sampling from Stationary Situations*
Part 6 Hard Coal—Preparation of Samples
Part 7 Coke—Preparation of Samples*
Part 8 Determination of Precision and Bias.

Work is also proceeding on the preparation of standards for the sampling of solid-liquid slurries and solid-gas suspensions.

*In course of preparation.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
SAMPLING OF SOLID MINERAL FUELS

PART 1—GUIDE TO THE USE OF PARTS 2 TO 8

1 SCOPE. This standard provides a brief description of the contents of, and information for the use of AS 2646, Parts 2 to 8.

The aim of this document is to provide general guidance on the use of AS 2646, Parts 2 to 8, with particular reference to the following:

(a) Procedures to be followed when a new sampling scheme is set up or when sampling of a new material is to be performed, including determination of the precision of sampling.

(b) Decisions on the size and number of increments and/or sampling units to be taken in any particular sampling situation.

(c) Procedures to be followed when bias is suspected or when a test for bias is to be undertaken.

(d) Procedures for the preparation of samples.

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

AS 2418 Glossary of Terms Relating to Solid Mineral Fuels

AS 2646 Sampling of Solid Mineral Fuels
- Part 2—Hard Coal—Sampling from Moving Streams
- Part 3—Coke—Sampling from Moving Streams
- Part 4—Hard Coal—Sampling from Stationary Situations
- Part 5—Coke—Sampling from Stationary Situations
- Part 6—Hard Coal—Preparation of Samples
- Part 7—Coke—Preparation of Samples
- Part 8—Determination of Precision and Bias.

3 DEFINITIONS. For the purpose of this standard, the definitions in AS 2646, Parts 2 to 8 and AS 2418 apply.

4 STRUCTURE OF THE PARTS. Each of Parts 2 to 8 of AS 2646 commences with a series of clauses covering Scope, Referenced Documents and Definitions. AS 2646, Part 8 also contains an extensive listing and definition of symbols used in that Part and in the statistical treatment of data derived in tests for precision and bias.

AS 2646, Parts 2 and 3 relate to sampling in dynamic situations and contain clauses on procedures for establishing a sampling scheme, the minimum masses of increments to be taken, the numbers of increments and sampling units and procedures for manual and mechanical sampling on a mass or time basis. They also include on-line sample preparation.

AS 2646, Parts 4 and 5 relate to manual sampling in static situations and contain similar information about numbers and masses of increments to that in AS 2646, Parts 2 and 3.

Appendices to AS 2646, Parts 2 to 5 describe items of manual and mechanical sampling apparatus.

AS 2646, Parts 6 and 7 cover the fundamentals of sample preparation, and details of the preparation of samples for total moisture, general analysis and special tests, requiring varied treatment. Appendices include diagrams of sample preparation apparatus.

AS 2646, Part 8 covers the determination of the precision of sampling, sample preparation and testing, precision of sample preparation and testing, and the testing for bias in sampling.

5 SAMPLING.

5.1 General. For the purpose of this standard, a 'sampling scheme' refers to the number of increments to be taken and/or the number of sampling units into which the lot is to be divided in order to achieve the desired sampling precision. A 'sampling system' refers to the mechanical or manual means by which sampling is carried out.

Sampling should be carried out by systematic stratified sampling, either on a mass basis or on a time basis, provided that it can be established that no systematic error will be introduced due to periodic quality or quantity variation coinciding with the selected sampling intervals. If a systematic error (bias) is likely to be introduced, sampling should be carried out by random stratified sampling on a mass or time basis.

When establishing a sampling scheme by either mass basis or time basis sampling, it is necessary to determine the size of the lot (consignment) which it is required to characterize.

The size of the lot will vary considerably, ranging from small deliveries of a few tonnes to quantities in excess of 100 000 t.

Lot sizes will frequently also vary considerably in any single application. For example, the size of individual lots loaded on to vessels at an export coal terminal may vary from about 5000 t to more than 150 000 t. It is generally desirable to characterize each such individual lot with an equal precision since sales contract penalty and bonus provisions normally do not take account of varying lot sizes. In order to achieve this objective it would be necessary to perform sampling with widely varying intensity, i.e. to vary the frequency of taking increments depending on the lot size.

Any sampling scheme at a particular installation should allow for considerable flexibility. This may be difficult to arrange, especially in a mechanical sampling