Australian Standard®

Coal and coke—Analysis and testing

Part 24: Guide to the evaluation of measurements made by on-line coal analysers

This Australian Standard was prepared by Committee MN/1, Coal and Coke. It was approved on behalf of the Council of Standards Australia on 12 September 1997 and published on 5 January 1998.

The following interests are represented on Committee MN/1:

ACIRL

Australasian Institute of Mining and Metallurgy

Australian Coal Association

Australian Coal Preparation Society

Australian Institute of Energy

Bureau of Steel Manufacturers of Australia

Coalfield Geology Council of New South Wales

CSIRO, Division of Coal and Energy Technology

Department of Mines and Energy, Queensland

Electricity Supply Association of Australia

Institution of Engineers, Australia

Minerals Council of Australia

University of Newcastle

University of New South Wales

University of Queensland

This Standard was issued in draft form for comment as DR 95225.

Australian Standard®

Coal and coke—Analysis and testing

Part 24: Guide to the evaluation of measurements made by on-line coal analysers

First published as AS 1038.24—1998.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7337 1514 1

PREFACE

This Standard was prepared by the Standards Australia Subcommittee on Coal Evaluation, in collaboration with the Subcommittee on Coal Sampling and under the supervision of the Committee on Coal and Coke.

In preparing this document, reference was made to the ISO working draft *Solid mineral fuels—Evaluation of the measurement performance of on-line analysers*, August 1995. Additionally, reference was made to the draft ASTM *Standard guide to the evaluation of measurements made by on-line analysers*, Draft #9, May 23, 1994.

The objective of this Standard is to provide users of on-line coal analysers with guidance to the interpretation of the measurements made, so that the performance of analysers, which offer significant benefits to the coal industry, can be evaluated.

The term ‘informative’ has been used in this Standard to define the application of the Appendices to which it applies. An ‘informative’ appendix is for information and guidance only.

CONTENTS

FOREWORD

With the introduction of on-line analysers to the coal industry, coal analysis in real time has become technologically possible. Immediate on-line quality measurement offers substantial commercial benefit to coal producers and consumers.

In order for users to accept the analyses generated by on-line analysers, it is necessary to have an understanding of the limitations of both the on-line analysers and conventional sampling/laboratory practice.

This Guide outlines the procedures necessary for assessing the performance of on-line analysers, by comparison with the results of conventional sampling and laboratory techniques.

Detailed descriptions of statistical methods have been avoided in this Guide, and for more information reference should be made to the many papers on the subject.

STANDARDS AUSTRALIA

Australian Standard

Coal and coke—Analysis and testing

Part 24: Guide to the evaluation of measurements made by on-line coal analysers

1 SCOPE This Guide sets out recommended practices for the evaluation of on-line coal analysers.

It defines various categories of analyser and describes their operation. It also describes appropriate techniques of statistical assessment and makes specific recommendations concerning the procedures for evaluation and calibration maintenance of on-line analysers.

This Guide will—

(a) clarify terminology;

(b) present an overview of different kinds of analysers commercially available;

(c) provide general observations regarding interpretation of measurements by on-line analysers; and

(d) present to prospective users options available to evaluate performance of on-line analysers.

NOTE: A bibliography of reference texts appropriate to the various sections of this Guide is given in Appendix A.

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

AS
2243 Safety in laboratories

2418 Coal and coke—Glossary of terms

4264 Coal and coke—Sampling
4264.1 Part 1: Higher rank coal—Sampling procedures
4264.3 Part 3: Lower rank coal—Sampling procedures
4264.4 Part 4: Determination of precision and bias

Code of practice for the safe use of radiation gauges—National Health and Medical Research Council

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

3.1 Absolute dynamic precision—a measure of the extent of agreement between test results, obtained from measurements made over a defined period of time on a set of samples of coal presented to the analyser in its normal operational mode by a comparative test method that eliminates bias and random errors attributable to the reference method.

3.2 Accuracy—the closeness of agreement between an observation and the true value. The accuracy of a result is not to be confused with its precision. A determination can be made with great precision so that the standard deviation of a number of determinations on the same consignment of coal may therefore be low, but the results will be accurate only if they are free from bias. Thus, accuracy includes the effect of precision and bias.