Australian Standard®

Heavy mineral sand concentrates—Sampling

Part 4: Determination of precision and bias

This Australian Standard was prepared by Committee MN/4, Heavy Mineral Sands. It was approved on behalf of the Council of Standards Australia on 15 November 1996 and published on 5 January 1997.

The following interests are represented on Committee MN/4:

Chamber of Mines of W.A.

CSIRO, Division of Minerals

University of Queensland

Additional interests participating in preparation of Standard:

Mineral sands producer companies

Superintending companies

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PREFACE

This Standard was prepared by the Standards Australia Committee on Heavy Mineral Sands. It is one of a series of Standards prepared for the sampling of heavy mineral sands.

Other parts of this Standard are as follows:

Part 1: Sampling from moving streams
Part 2: Sampling from stationary situations
Part 3: Preparation of samples

The objective of this Standard is to provide those responsible for sampling heavy mineral sands with means for checking and adjusting the precision and bias of sampling.

The term 'normative' is used in this Standard to define the application of the Appendix to which it applies. A 'normative' appendix is an integral part of a Standard.

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STANDARDS AUSTRALIA

Australian Standard

Heavy mineral sand concentrates—Sampling

Part 4: Determination of precision and bias

1 SCOPE This Standard sets out methods for checking and adjusting the precision of sampling, checking the precision of sample preparation and testing, and testing for bias in the sampling of heavy mineral sands.

The procedures described in this Standard apply to sampling from both moving streams and stationary situations, and to the subsequent sample preparation.

Experiments to check for precision and bias should be carried out for all sampling programs, whether manual or employing mechanical elements, implemented on a regular basis. Procedures should be repeated whenever significant change in the character of materials being sampled, especially in nominal top size or particle size distribution, has occurred.

When a mechanical installation is commissioned or when principal parts are modified, check experiments for precision and bias should be carried out for the installation as a whole. The material to be used for the bias tests should be the most variable material that is likely to be sampled. Various parameters can be used as measures of the variability of the material.

Where a bias higher than the maximum acceptable bias is detected, checks of individual elements of the system should be made, to determine which part or parts of the installation may require modification.

The preferred method of testing for bias (see Clause 8) is by comparison with 'stopped-belt' sampling and using the critical properties in the operation of the sampling system.

Design criteria of primary samplers for avoiding bias in a mechanical sampling system are given in AS 2884.1 and AS 2884.2. Reference is made to the geometry of cutter opening design and aperture, cutting speeds, measures for prevention of sample change and contamination, and procedures for examination of the performance of mechanical sampling equipment.

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

1152 Specification for test sieves

2884 Heavy mineral sand concentrates—Sampling
2884.1 Part 1: Sampling from moving streams
2884.2 Part 2: Sampling from stationary situations
2884.3 Part 3: Preparation of samples
[illegible]
3534 Statistics—Vocabulary and symbols

3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

3.1 Bias—the tendency to obtain a value that is either persistently higher or persistently lower than the reference value. Alternatively, the difference between the reference value and the average result obtained from a large number of determinations using a biased method.