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COPPER, LEAD AND ZINC SULPHIDE CONCENTRATES— SAMPLING

Part 3—PREPARATION OF SAMPLES

STANDARDS ASSOCIATION OF AUSTRALIA
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Australasian Institute of Mining and Metallurgy

Australian Mineral Development Laboratories

Australian Mining Industry Council

CSIRO, Institute of Energy and Earth Resources

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AUSTRALIAN STANDARD

COPPER, LEAD AND ZINC SULPHIDE CONCENTRATES—SAMPLING

Part 3

PREPARATION OF SAMPLES

AS 2862.3—1986

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PREFACE

This standard was prepared by the Association's Committee on Copper, Lead and Zinc Ores and Concentrates under the direction of the Minerals Standards Board as one of a proposed series of standards for the sampling of sulphide concentrates. It sets out techniques for the preparation of samples of copper, lead and zinc sulphide concentrates for chemical analysis and the determination of moisture.

Correct sample preparation is a prerequisite for the accurate analysis of sulphide concentrates as the material has a tendency to oxidize.

This standard is Part 3 of a series of standards. Other standards in this series are as follows:

AS 2862.1—Sampling from Moving Streams*
AS 2862.2—Sampling from Stationary Situations*
AS 2862.4—Determination of Precision and Bias*

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* In course of preparation.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
COPPER, LEAD AND ZINC SULPHIDE CONCENTRATES—SAMPLING

PART 3—PREPARATION OF SAMPLES

1 SCOPE. This standard sets out methods for the preparation of samples of copper, lead and zinc sulphide concentrates for the determination of bulk moisture content, chemical composition and physical properties.

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

AS 1152	Test Sieves
AS 2862	Copper, Lead and Zinc Sulphide Concentrates—Sampling,
AS 2862.1	Sampling from Moving Streams*
AS 2862.2	Sampling from Stationary Situations*
AS 2863	Copper, Lead and Zinc Sulphide Concentrates—Determination of Moisture in Bulk Material

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

3.1 Chemical analysis sample—a sample available (without further preparation) for determination of chemical composition.

3.2 Gross sample—a quantity of concentrate consisting of all of the increments or all of the subsamples taken from the lot; also a composite of all of the increments or all of the subsamples after having been reduced in particle size.

3.3 Increment—a quantity of concentrate taken by—

(a) a single pass of the sampling device in the case of mechanical sampling; or

(b) either a single pass or the combined sum of multiple passes of the sampling implement in the case of manual sampling.

3.4 Lot—a quantity of concentrate delivered at one time. The lot may be composed of one or more sampling units.

3.5 Moisture sample—a sample available (without further preparation) for determination of moisture content.

3.6 Nominal top size—the size of aperture of the finest sieve (complying with AS 1152) through which a minimum of 95 percent of the mass of the material passes.

3.7 Physical testing sample—a sample available (without further preparation) for the determination of physical properties.

3.8 Sampling unit—the discrete units which comprise the lot.

3.9 Subsample—a quantity of concentrate, consisting of a number of increments representing all or part of a sampling unit.

4 GENERAL RULES. All samples from a lot shall be taken in accordance with AS 2862.1 or AS 2862.2. Moisture samples should be extracted as soon as possible and weighed immediately. If this is not possible, the gross sample or subsample shall be stored in an impervious air-tight container with a minimum of free air space in order to minimize any change of moisture content.

Throughout all the procedures of sample preparation, samples shall be protected from any alteration other than in the case of the chemical analysis samples, particle size reduction and drying.

5 FUNDAMENTALS OF SAMPLE PREPARATION.

5.1 General. Sample preparation involves several distinct operations, which are sometimes preceded by drying. These are as follows:

(a) Mixing in order to achieve homogeneity.

(b) Division, in which the sample mass is decreased by dividing the sample into two or more parts.

(c) Reduction, to decrease particle size.

The operations referred to in (a) and (b) above are generally considered to constitute one stage of sample preparation.

Stages of sample preparation should be chosen to minimize errors during sample preparation without having to retain too large a mass.

5.2 Sample mixing.

5.2.1 *General.* Errors in sample division can be reduced by thorough mixing of the sample prior to division. The need for mixing is particularly important when samples from more than one source are combined. Any agglomerates present need first to be broken up as described in Clause 7.2(a).

5.2.2 *Methods of mixing.* Mixing can be carried out by one of the following methods:

(a) Passing the sample through a riffle or rotary sample divider 3 times in succession and recombining the portions after each pass.

(b) Using a mechanical mixer (see Fig. 1).

(c) Strip mixing. The concentrate is formed into a strip by careful distribution of the concentrate from a shovel. The length/width ratio of the strip shall be not less than 10:1. A complete cross-section of the concentrate strip is taken randomly, and spread out to form a new strip. Successive cross-sections are taken randomly and spread out on top of the preceding cross-section, layer upon layer, until the old strip has been converted into a new strip. The process of taking cross-sections is repeated twice.

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* In course of preparation.