

Australian Standard™

**Copper, lead and zinc sulfide  
concentrates—Sampling**

**Part 1: Sampling procedures for  
determination of metal and moisture  
content**

[ISO title: Copper, lead and zinc sulfide concentrates—Sampling procedures  
for determination of metal and moisture content]

This Australian Standard was prepared by Committee MN/5, Copper, Lead, Zinc, Gold and Silver Ores and Concentrates. It was approved on behalf of the Council of Standards Australia on 15 July 1999 and published on 5 August 1999.

---

The following interests are represented on Committee MN/5:

Australasian Institute of Mining and Metallurgy

Australian Lead Development Association

CSIRO, Division of Minerals

Minerals Council of Australia

The Royal Australian Chemical Institute

---

**Review of Australian Standards.** *To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.*

*Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.*

*Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.*

---

*This Standard was issued in draft form for comment as DR 98653.*

Australian Standard™

**Copper, lead and zinc sulfide  
concentrates—Sampling**

**Part 1: Sampling procedures for  
determination of metal and moisture  
content**

First published as AS 2862.1—1999.

## PREFACE

This Standard was prepared by the Standards Australia Committee MN/5, Copper, Lead, Zinc, Gold and Silver Ores and Concentrates as part of a programme of standardizing methods for the determination of elements of commercial interest in such materials.

The objective of this Standard is to provide those involved in the sampling of sulfide concentrates with a standardized sampling procedure for determination of metal and moisture content.

This Standard is identical with and has been reproduced from ISO 12743:1998, *Copper, lead and zinc sulfide concentrates—Sampling procedures for determination of metal and moisture content* which has been prepared by ISO/TC 183 Copper, Lead and Zinc Ores and Concentrates. Australia holds the Chairmanship and Secretariat of ISO/TC 183 and has made a significant contribution to the preparation of ISO 12743.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on its cover and title page.
- (b) In the source text, 'this International Standard' should read 'this Australian Standard'.
- (c) A full point substitutes for a comma when referring to a decimal point.

The references to International Standards should be replaced by references, where appropriate, to the following Australian or Joint Australian/New Zealand Standards:

<i>Reference to International Standard or other publication</i>	<i>Australian or Joint Australian/New Zealand Standard</i>
ISO	AS
10251 Copper, lead and zinc sulfide concentrates—Determination of mass loss of bulk material on drying	2863 Copper, lead and zinc sulfide concentrates—Determination of mass loss of bulk material on drying
12744 Copper, lead and zinc sulfide concentrates—Experimental methods for checking the precision of sampling	2862 Copper, lead and zinc sulfide concentrates—Sampling
	2862.2 Part 2: Experimental methods for checking the precision of sampling
13292 Copper, lead and zinc sulfide concentrates—Experimental methods for checking the bias of sampling	2862.3 Part 3: Experimental methods for checking the bias of sampling

## © Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

## CONTENTS

	<i>Page</i>
1 Scope .....	1
2 Normative references .....	1
3 Definitions .....	1
4 Sampling theory .....	3
5 Establishing a sampling scheme .....	12
6 Mass of increment .....	16
7 Methods of sampling of concentrate streams .....	17
8 Mechanical sampling of concentrate streams .....	21
9 Manual sampling of concentrate streams .....	25
10 Stopped-belt reference sampling .....	28
11 Sampling from grabs .....	28
12 Sampling from trucks and railway wagons .....	29
13 Sampling of concentrate in bags or drums .....	31
14 Sampling of stockpiles .....	32
15 Methods of comminution, mixing and division .....	35
16 Sample requirements .....	45
17 Packing and marking of samples .....	46
<b>Annexes</b>	
<b>A</b> (informative) Sampling stage method of estimating sampling and total variance ..	<b>47</b>
<b>B</b> (informative) Estimation of total variance—Barge unloading using a grab .....	<b>53</b>
<b>C</b> (informative) Mechanical sample cutters .....	<b>57</b>
<b>D</b> (informative) Checklist for mechanical sampling systems .....	<b>60</b>
<b>E</b> (normative) Manual sampling devices .....	<b>62</b>
<b>F</b> (informative) Apparatus for manual sampling of concentrates from stopped belts ..	<b>64</b>
<b>G</b> (informative) Sampling of stockpiles .....	<b>65</b>
<b>H</b> (normative) Increment division scoops for conducting manual increment division ..	<b>67</b>
<b>Bibliography</b> .....	<b>68</b>



## AUSTRALIAN STANDARD

**Copper, lead and zinc sulfide concentrates—Sampling**

## Part 1:

## Sampling procedures for determination of metal and moisture content

**1 Scope**

This International Standard sets out the basic methods for sampling copper, lead and zinc concentrates from moving streams and stationary lots, including stopped-belt sampling, to provide samples for chemical analysis, physical testing and determination of moisture content in accordance with the relevant International Standards. Where the concentrates are susceptible to significant oxidation or decomposition, it is necessary to use a common sample for moisture determination and chemical analysis to eliminate bias (see ISO 10251). In such cases, the common sample needs to be sufficiently representative, i.e. unbiased and sufficiently precise, for chemical analysis and determination of moisture content. Any large agglomerates (>10 mm) present in the primary sample are crushed prior to further sample processing. Sampling of concentrates in slurry form is specifically excluded from this International Standard.

Stopped-belt sampling is the reference method for collecting concentrate samples against which mechanical and manual sampling procedures may be compared. Sampling from moving streams is the preferred method. Both falling-stream and cross-belt samplers are described.

Sampling from stationary lots is used only where sampling from moving streams is not possible. The procedures described in this International Standard for sampling from stationary lots only minimize some of the systematic sampling errors.

**2 Normative references**

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate applying the most recent editions of standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 10251 1:—<sup>1)</sup>:1998, *Copper, lead and zinc sulfide concentrates - Determination of mass loss of bulk material on drying.*

ISO 12744:1997, *Copper, lead and zinc sulfide concentrates - Experimental methods for checking the precision of sampling.*

ISO 13292:—<sup>1)</sup>:1998, *Copper, lead and zinc sulfide concentrates - Experimental methods for checking the bias of sampling.*

**3 Definitions**

For the purposes of this International Standard, the following definitions apply.

**3.1 representative sample:** A quantity of concentrate representing a larger mass of concentrate with both precision and bias within acceptable limits.

---

<sup>1)</sup> To be published.