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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 30083-2013

**Copper, lead and zinc ores and concentrates -- Precision and
bias of mass measurement techniques**

铜、铅和锌矿及精矿 计量方法的精密度和偏差

(English Translation)

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Table of Contents

- Foreword
- 1 Scope
- 2 Normative references
- 3 Terms and Definitions
- 4 Subjects
- 4.3 Measurement weighbridge
- 4.4 Hopper scales measuring
- 4.6 Measurement Scales

Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

This standard uses the translation method identical with ISO 12745:2008 "The precision and bias of copper, lead and zinc concentrates and methods of measurement." this standard and ISO 12745:2008 The main differences are as follows.

- With a decimal point instead of a comma as the decimal point in the international standard " , " . " , " ;
- Use the "standard" instead of "this International Standard";
- According to Chinese customary change the standard name;
- Remove the cover of the international standards, directory, foreword and introduction.

This standard by the national non-ferrous metals Standardization Technical Committee (SAC/TC243) centralized.

1 Scope

This standard specifies the calculation method bias, precision, and a method of metering the resulting quality of the various methods of measurement precision.

This standard is based on a statistical validation of measurement methods by unbiased data, calculate the variance measure of its precision and examined within its operating range Linearity of measurement based on. The calibration method and results of performance testing using the applicable provisions of the quantitative measurement methods can be used to fine and to determine the linear density and deviation measuring device.

The standard deviation is used to calculate the vehicle or concentrate shipping wet weight measurement method, as the two sides trade transport, insurance, pre-paid and most end the basis for calculation.

Static scale applications require at least not less than 1t quality of the goods in order to check, and that the quality should be consistent with the scale range. With a series of cover Cover the entire weighing device quality standard was applied load operating range as to estimate its precision and detect its entire operating range of linear, indeed Recognize its calibration status process.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 3358.1-2009 Statistics Vocabulary and symbols - Part 1. General statistical terms and terms used in probability (ISO 3534.1, IDT) GB/T 3358.2-2009 Statistics Vocabulary and symbols - Part 2. Applied Statistics (ISO 3534.2, IDT) GB/T 6379.1-2004 measurement methods and results of Accuracy (trueness and precision) Part 1 General principles and definitions (ISO 5725.1, IDT)

3 Terms and Definitions

The following terms and definitions apply to this document.

Note 1: In the application of the statistical authority of books, σ^2 only used only for an unknown population variance estimation of the measurement process. On the contrary, the symbol for the sample variance s^2 and Thus limiting the adjustment measurements. The standard method of bulk sampling or σ σ^2 often used to distinguish.

Note 2: The following definitions of the most commonly used measurement technology concepts and terminology, and to clarify the risk of cargo damage gain the possibility of quantitative methods and standard commercial transport Non-standard expected difference between the method used.

Accuracy

Quality measurement results and the degree of consistency between the true value.

Note: Accuracy can not be measured abstraction, but by bias or systematic error can be quantified accuracy deviation measured.

Bias

Expectations and accept the results of the difference between the reference value.

Note: This definition is valid only when accepted reference value is known and has the absolute degree of certainty (quality and length of international units). Suppose accepted reference value

limited Within the confidence limits are known and accepted reference test results fall within the expected value of the confidence limits than expected and accepted reference value is the difference between the test results deviation. For example, typically granted only by the quality of one measurement, the measurement value is not expected. This standard deviation is granted independence wet weight Estimated statistically significant difference between the values (loading and unloading, called static and dynamic said), and quality measurement should as much as possible by the most direct Money transfer dates back to the national prototype kilogram and the quality of international units.

Belt scales beltscale the goods on the belt through the inner conveyor section hanging scales continuously accumulated and recorded in the cumulative mass metering device.

NOTE: The belt scale is a continuous metering device calibration method. applied load, such as calibrated chain (dynamic) on the segment portion of the belt weigher, or standard quality material Hanging in the balance after a certain frame accumulation period (static), or with a belt measuring scales have weighing scales from static quality of the material (material weighing method).

Deviation detection limit (BDL) biasdetectionlimit T test or inspection system deviation plus loads and loads measured deviation between capacity and sensitivity.

The coefficient of variation (CV) coefficientofvariation Measuring measurement methods of stochastic volatility, the standard deviation value equal to a percentage of the measurement quality.

Confidence interval (CI) confidenceinterval A certain confidence level, including all possible difference measurements and the mean of their range.

Confidence Range (CR) confidencerange A certain confidence level, including all measurements, including the possible range.

NOTE: science and engineering generally use 95% confidence intervals and scope.

The correlation coefficient (r) correlationcoefficient Measuring a series of standard quality was measured and the correlation between loads or independence.

Water gauge measuring draftsurvey Based on a measurement method to convert the difference freighter under different loading conditions to mass displacement, the method must be established taking into account the water Density, temperature and ballast and ballast supply and the impact of changes in water gauge table.

Note: The water gauge is measured based on Archimedes' principle, which floats suffered buoyancy equal to its gravity. Quality goods can be shipped by water gauge, parallax, press Changes cabin was consumed and the supply was converted to mass measured according to the ship's water gauge table.

3.10

Precision

Measurement methods of the cumulative effect of random fluctuations.

Note: The precision is a special word, such as "high-precision", "low precision" and "high precision quality", although no quantitative information but they are effective description.

3.11

Possible deviation range (PBR) probablebiasrange for only the risk class I or II I type and category of risk is measured deviation located at a predetermined probability condition limits.

3.12

Relative standard deviation (sr) relativestandarddeviation Measuring measurement methods of random fluctuations, numerically equal to the standard deviation divided by the measurement quality.

3.13

Standard deviation (s) standarddeviation Measuring measurement methods of random fluctuations, numerically equal to the square root of the variance.

3.14

Static scale Would, or funnel suspended gantry static load converted to mass metering device or platform on the scales.

Note: static scale batch type measuring device using a single standard weights or calibration correction hydraulic device. Static scale can automatically zero, so that by the tare and the difference between gross and accumulated to quality. Double hopper scales can achieve approximate continuous mass flow during loading and unloading operations without sacrificing the accuracy and static scales Precision quality.

3.15

T-test (t) Student'st-value Series than the difference between the standard deviation of the mean difference between the applied load and average load measurements mean.

3.16

Class I risk (alpha) typelrisk when the mean difference is statistically equivalent to zero, assuming a series of applied load and average load measurement is consistent, alpha to reject the hypothesis risk.

3.17

II class risk (beta) typellrisk when the mean difference statistically not zero, assuming a series of applied load and average load measurement is consistent, beta risk to reject the hypothesis.

3.18