



# Standard Practice for Drying of Metal Bearing Ores, Concentrates and Related Metallurgical Materials for the Determination of Mercury<sup>1</sup>

This standard is issued under the fixed designation E 2293; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice covers the sample drying step for the determination of mercury in ores, concentrates and related metallurgical materials.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

### 2.1 ASTM Standards:

E 135 Terminology Relating to Analytical Chemistry for Metal, Ores, and Related Materials<sup>2</sup>

E 877 Practice for Sampling and Sample Preparation of Iron Ores<sup>2</sup>

E 882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory<sup>2</sup>

### 2.2 Other Documents:

ISO 9599 Copper, Lead and Zinc Sulfide Concentrates-Determination of Hygroscopic Moisture in the Analysis Sample-Gravimetric Method

ISO 12743 Copper, Lead, and Zinc Sulfide Concentrates-Sampling Procedures for the Determination of Metal and Moisture Content

ISO 10251 Copper, Lead and Zinc Sulfide Concentrates-Determination of Mass Loss of Bulk Material on Drying

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this Practice, refer to Terminology E 135.

## 4. Summary of Practice

4.1 Test samples for be used for mercury determination are dried at 60°C.

## 5. Significance and Use

5.1 This practice is primarily to be used to dry samples for the determination of mercury test portions, and it should not be used for the determination of sample moisture content. Most sample preparation methods prescribe drying the samples at 105°C, until a constant mass is obtained. The moisture content is determined as the percentage mass loss on drying. However, since mercury can volatilize from samples at the normally utilized temperature, samples that are to be used for mercury determination shall be dried at 60°C (See Practice E 877, Method ISO 9599, Method ISO 1273, and Method ISO 10251).

5.2 It is assumed that all who use this practice will be trained analysts capable of performing skillfully and safely. It is expected that work will be performed in a properly equipped laboratory under appropriate quality control practices such as those described in Guide E 882.

## 6. Apparatus

6.1 *Drying Oven*, ventilated with forced circulation of air, regulated at a temperature of  $60 \pm 2^\circ\text{C}$ .

6.2 *Top-Loading Balance*, minimum precision of 0.01 %.

6.3 *Drying Trays*, capable of holding at least a one kg sample, spread no thicker than 3 cm deep.

## 7. Hazards

7.1 For precautions to be observed in this practice, refer to Practice E 50.

7.2 Mercury can form vapors at low temperatures. Mercury vapors can be hazardous to your health. Perform method in ventilated areas or wear special health protection equipment.

## 8. Procedure

8.1 Remove a representative laboratory sample, 500 g minimum, from the gross sample.

8.2 Place the laboratory sample into a drying tray and level to approximately 3 cm.

8.3 Weigh to within 0.01 g on the top loading balance.

8.4 Place the tray and test portion into the drying oven and dry at 60°C for at least 16 h.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee E01 on Analytical Chemistry for Metals, Ores and Related Materials and is the direct responsibility of Subcommittee E01.02 on Ores, Concentrates, and Related Metallurgical Materials.

Current edition approved June 10, 2003. Published July 2003.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 03.05.

NOTE 1—Once the drying period has commenced, no other wet samples should be placed into the same drying oven.

8.5 Remove the tray and laboratory sample from the oven and weigh. Dry the tray and laboratory sample for an additional 4 h. Remove from the oven and weigh again. Repeat this step as necessary until two successive determinations of the mass of the tray plus dried laboratory sample agree within 0.2 % percent relative. (See Method ISO 9599, Method ISO 12743, and Method ISO 10251.)

NOTE 2—Any crusts or cakes that form on the laboratory sample after initial drying should be broken up to enable easier release of moisture.

8.6 Prepare the dried test sample for the determination of mercury according to the appropriate technique.

## 9. Keywords

9.1 drying; mercury; moisture; sample preparation

*ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.*

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or [service@astm.org](mailto:service@astm.org) (e-mail); or through the ASTM website ([www.astm.org](http://www.astm.org)).*