



Designation: E2296 – 21

Standard Practice for Silver Corrections in Metal Bearing Ores, Concentrates, and Related Metallurgical Materials by Fire Assay Slag Recycling and Cupel Proof Gravimetry¹

This standard is issued under the fixed designation E2296; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the silver loss correction, utilizing slag recycling and cupellation of proof silver during the fire assay of metal bearing ores, concentrates, and related metallurgical materials.

1.2 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* (See Practices E50 and ISO 35:2006.)

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E50 Practices for Apparatus, Reagents, and Safety Considerations for Chemical Analysis of Metals, Ores, and Related Materials

E135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials

¹ 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.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

E882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory

2.2 *ISO Documents:*³

ISO 35:2006 Certification of Reference Materials—General and Statistical Principles

ISO 10378:2016 Copper Sulfide Concentrates—Determination of Gold and Silver Contents—Fire Assay Gravimetric and Atomic Absorption Spectrometric Method

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology E135.

4. Summary of Practice

4.1 In the process of fire assay fusion, the slag is retained from the initial fusion and reprocessed through the fusion procedure. The resulting lead button is combined with the preliminary lead button during cupellation. Proof silver is carried through the cupellation procedure to determine the silver losses. (See ISO 10378:2016, Bugbee,⁴ and Smith⁵.)

5. Significance and Use

5.1 This practice is primarily intended to be used for the correction of silver loss in the fire assay process. Silver contents are determined by fire assay for the purpose of metallurgical exchange between buyer and seller. 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 E882.

³ Available from International Organization for Standardization (ISO), ISO Central Secretariat, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <https://www.iso.org>.

⁴ Bugbee, E. E., *A Textbook of Fire Assaying*, Third Ed., John Wiley and Sons, Inc., Hoboken, NJ, 1946.

⁵ Smith, E. A., *The Sampling and Assay of the Precious Metals*, Second Ed., Charles Griffin and Co., Ltd., 1947.